



# NAVAL INSPECTOR GENERAL SPECIAL STUDY FOR THE SECRETARY OF THE NAVY

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## OVERSEAS DRINKING WATER SPECIAL STUDY II

**JULY 2013**

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## Executive Summary

In January 2009, the Naval Inspector General (NAVINSGEN) published a report concerning overseas drinking water systems. The report concluded that overseas Navy installations did not meet the same public health standards as Navy installations in the United States. In response to this report, Secretary of the Navy (SECNAV) released a memorandum to the Chief of Naval Operations (CNO) stating:

***“It is imperative that Navy personnel receive the same quality of drinking water at overseas installations as they do in the United States.”<sup>1</sup>***

CNO, in turn, tasked Commander, Navy Installations Command (CNIC) and Commander, Naval Facilities Engineering Command (NAVFAC) to:

***“...establish protocols and procedures to ensure our overseas installations have drinking water that meets or exceeds the United States water quality standards.”<sup>2</sup>***

Further, CNO provided an enclosure assigning actions for the NAVINSGEN report recommendations. Of note, the enclosure did not assign Navy Bureau of Medicine and Surgery (BUMED) an oversight role as the public health authority as recommended by NAVINSGEN. Instead, a water quality oversight group was assigned responsibility for providing (in theory) the third party oversight role that the Environmental Protection Agency (EPA) provides in the United States. This led to the development of a management-by-committee system of water quality boards to provide management and internal oversight among the owners/operators of the overseas drinking water systems. In 2013, the Deputy Chief of Naval Operations for Fleet Readiness and Logistics (OPNAV N4) assigned CNIC as the executive agent for overseas drinking water.<sup>3</sup> This assignment reinforced, with some minor changes, the same management framework that has been in place since 2009. Implementation of CNO’s assigned actions has been slow and ineffective in resolving long-term deficiencies and is woefully deficient in achieving SECNAV’s 2009 imperative. Evidence supporting this is provided in CNIC One-Day Assessments<sup>4</sup> for each overseas drinking water system, which indicated that not a single system was in compliance with U.S. standards and many were not in compliance with Final Governing Standards (FGS). NAVINSGEN concludes that the current management framework’s performance is limited by its flawed business model and lacks the capability to meet SECNAV’s 2009 imperative.

Four years after SECNAV’s 2009 imperative, not a single Navy overseas drinking water system meets U.S. compliance standards.

<sup>1</sup>SECNAV memo for the CNO, Overseas Potable Water Systems, 28 January 2009

<sup>2</sup>CNO memo for the SECNAV, Overseas Potable Water Systems, 11104 Ser N00/100022, 1 April 2009

<sup>3</sup>OPNAV N4 letter to CNIC, BUMED and NAVFAC, Drinking Water Ashore, 5090 Ser N4/13U1360007, 4 February 2013

<sup>4</sup>CNIC brief, Overseas Drinking Water One-Day Assessments, March 2013

The current management framework combines oversight, management and operations into a single model relying on significant part-time oversight with no enforcement authority. Additionally, a large percentage of water operators lack the necessary training and professional skill sets to deliver compliant drinking water on a daily basis. The Navy must consider the value of continuing to implement this current management framework given the poor return on investment this system yields when measured for its lack of compliance to U.S. standards and FGS.

Because of the lack of progress within the Navy overseas drinking water program over the last four years, noncompliance with SECNAV's 2009 imperative and BUMED's reluctance to accept a role greater than advisor, NAVINGEN concludes that the 2009 recommendation for oversight provided by BUMED as the public health authority is no longer sufficient. An independent primacy agency (that conducts oversight and enforcement) must be established to separate oversight and enforcement from the management and operations (CNIC, NAVFAC and BUMED) to ensure protection of public health is the priority for overseas drinking water systems.

The ineffective management-by-committee system of water quality boards diminishes accountability for compliance and, in our view, is a key factor contributing to the noncompliance with SECNAV's 2009 imperative. In the current managerial system for overseas drinking water, public health compliance remains subservient (as it was before this managerial system) to engineering priorities; there is a low correlation between managerial decisions made at various levels of the system of water quality boards and drinking water that is in compliance on a daily basis with SECNAV's 2009 imperative. In addition, this system routinely accepts risk associated with delivering drinking water that is not compliant with U.S. standards and FGS; this is in stark contrast to the compliance-based programs that Navy installations must adhere to in the United States. Currently, there is no enforcement of regulations at Navy overseas installations and no penalty for unresolved long-standing deficiencies and noncompliance with SECNAV's 2009 imperative and FGS. In contrast, Navy installations in the United States are subject to various punitive actions for noncompliance with the Safe Drinking Water Act (SDWA) and receive scrutiny from Congress<sup>5</sup> for not following Navy regulations.

Additionally, NAVINGEN's continued evaluation of the Navy's overseas drinking water program compliance with SECNAV's 2009 imperative has found (not all-inclusive):

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<sup>5</sup>Mark R. Warner, U.S. Senator (D-VA) letter to Chuck Hagel, Secretary of Defense, 4 April 2013 (Full copy in Appendix A)

- Overseas drinking water systems continue to be operated and maintained at lower standards than comparable Navy installations in the United States.
- Sailors, their families and Navy employees stationed overseas receive a poorer quality of water and greater health risk than when stationed in the United States; the Navy assumes the risk associated with this dichotomy.
- Numerous internal conflicts of interest inherent in the current self-regulating management system contribute to the failure of overseas drinking water program oversight.
- CNIC/NAVFAC overseas drinking water program process improvements, past and present, have often been in response to NAVINSGEN report findings, rather than driven by their own management and oversight systems.
- Some regions and installations, exemplified by Naval Air Station (NAS) Sigonella, openly and willfully violate U.S. standards and FGS, which can create a culture of indifference and a disregard for public health compliance.
- If our Navy overseas installations were operated in the United States, selective use of “health risk assessments” to circumvent drinking water standards/regulations and indifference to public health deficiencies would constitute knowing and willful violation of U.S. law.
- The Navy will not deliver safe drinking water on a daily basis at overseas installations until public health is the priority and all EPA primacy agency requirements are fully implemented throughout the Navy organization down to the installation water treatment plant level.

While the NAVINSGEN 2009 report focused on drinking water at numerous overseas Navy installations, this special study will focus primarily on drinking water at Navy installations in Sigonella (where we have the most data). There are many overseas Navy installations plagued by the same issues that are present at NAS Sigonella. NAVINSGEN is not minimizing the magnitude of the deficiencies at other overseas installations (some will be discussed where appropriate), but we think this “case study” approach should enable Navy leadership to understand the high likelihood that issues at NAS Sigonella are applicable to most, if not all, overseas installations.

NAVINSGEN concludes that the legacy of drinking water issues at NAS Sigonella has the potential for the same high profile and damaging negative consequences for the Navy that Camp Lejeune continues to have for the Marine Corps. This comparison is not focused solely on any particular drinking water contaminants, their concentrations, their sources, or even whether they have subsequently caused adverse health outcomes. Rather, this comparison focuses on common factors (that have equal or more weight than the actual science) we feel are becoming universal to public health issues such as: perception of risk, perceived betrayal of organizational core

values, poor organizational response, lack of transparency and stakeholder activism forging a nexus with the media, lawyers and Congress.

What distinguishes NAS Sigonella from Camp Lejeune is the large number of official documents citing repeated drinking water program discrepancies at NAS Sigonella. Over a period of time, region and installation leadership failed to: manage the water program in accordance with regulations, fix the repeated deficiencies identified during inspections, document the delivery of safe drinking water and inform Navy personnel of drinking water problems as they occurred. Primacy agencies do not tolerate these failures at Navy installations in the United States. The Navy has not heeded lessons learned from Camp Lejeune and has yet to respond to these legacy issues at NAS Sigonella, significantly increasing the Navy's risk of future liability, risk to reputation and most importantly risk to our people.

While this special study provides recommendations throughout, there are four key actions necessary to ensure “...that Navy personnel receive the same quality of drinking water at overseas installations as they do in the United States”<sup>6</sup> and to reduce Navy liability regarding legacy overseas drinking water issues:

- Implement the proven U.S. public health-based primacy agency model for oversight and enforcement of the Navy's overseas drinking water program that separates oversight and enforcement from management and operations of drinking water systems; this model focuses on public health as the priority and governs Navy installations within the United States.
- Implement a management structure that has the capability to fix long-standing deficiencies and focus on direct, rigorous and detailed management of water systems operations. The current management structure lacks these capabilities, which are necessary to meet SECNAV's 2009 imperative.
- Management and operations of overseas drinking water systems must provide comparable “professional-grade” training to water operators at overseas installations to meet U.S. standards and ensure that drinking water system operations are driven by detailed compliance benchmarks (for example, operating within the appropriate upper and lower limit for pH at all times).
- Develop an institutional risk-reduction strategy for managing the longer term legacy issues (documented for over 10 years at NAS Sigonella) to assess health risks and liabilities caused by the Navy's documented mismanagement of overseas drinking water programs. Retain all overseas drinking water program documents from destruction for the foreseeable future, which is currently permitted under FGS.

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<sup>6</sup>SECNAV memo, 28 January 2009

# Chapter 1: Requirement for a Primacy Agency

## 1.0 Introduction

This 2013 Overseas Drinking Water Special Study is an addendum to the 2009 Overseas Potable Water Summary Report. NAVINSGEN has continued to evaluate Navy progress to resolve management issues and deficiencies documented in the 2009 Summary Report. In addition, NAVINSGEN has assessed compliance with SECNAV's 2009 imperative that requires Navy personnel to receive the same quality of drinking water\* at overseas installations as they do in the United States. The Navy's overseas water program has a history of not correcting long-standing deficiencies and the current management framework that governs oversight and management of the Navy's overseas drinking water program relies on similar resources, procedures and personnel that were in place prior to the 2009 NAVINSGEN report. In reality, there has been a "reshuffling" of some resources, policies and procedures but no significant changes in resources or management that are capable of meeting the 2009 imperative or correcting long-standing deficiencies. There should be no doubt that "reshuffling" current resources, policies and procedures will not correct long-standing deficiencies or meet the additional requirements of SECNAV's 2009 imperative. To correct long-standing deficiencies and meet SECNAV's 2009 imperative, appropriate resources must be allocated and a new approach for oversight, enforcement, management and operations must be established. This special study identifies four key actions required to meet the 2009 imperative; each is discussed in four respective chapters. All four actions are required, in concert, to ensure the protection of public health and well-being of Sailors, their families and Navy employees that drink water every day onboard Navy overseas installations.

Chapter 1 discusses the primacy agency model that we feel is essential to meeting SECNAV's 2009 imperative and key to correcting long-standing deficiencies. Primacy agencies in the United States ensure the protection of public health in the management and delivery of drinking water with real enforcement and oversight powers. This chapter will discuss how the primacy agency concept is the appropriate model for the Navy's overseas drinking water program and correct current oversight deficiencies of the drinking water program. NAVINSGEN recommends that SECNAV establish a Primacy Agency Office to provide independent oversight with enforcement authority. Separating oversight and enforcement from management and operations is fundamental to the EPA primacy agency model that has been successful in

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\*The terms potable water and drinking water are used interchangeably in this special study.



protecting public health in the United States. To ensure that all overseas drinking water systems meet SECNAV's 2009 imperative, FGS, DoD and Navy instructions, this office must report directly to SECNAV and be independent of CNIC, NAVFAC and BUMED management and operations. The other recommendations provided throughout this special study are based on implementation of the SECNAV Primacy Agency Office to meet SECNAV's 2009 imperative.

Chapters 2-4 will provide supporting evidence about management, operations and legacy issues (respectively) that support the implementation of a primacy agency. The deficiencies that are discussed in these chapters are all directly related to a lack of an effective oversight and enforcement process. In turn, effective oversight and enforcement requires effective management and operations to correct identified deficiencies. Legacy issues are preventable when this system works in concert as proven during the last 39 years since the Safe Drinking Water Act (SDWA)<sup>7</sup> implemented the primacy agency model to protect public health in the management and delivery of drinking water in the United States.

## 1.1 What is a Primacy Agency?

Since 1974, primacy agencies in the United States have ensured the protection of public health in the management and delivery of drinking water through their primary enforcement authority (primacy) for

### What is Primacy?

In the United States, state government agencies usually administer the drinking water regulations on behalf of the EPA. Agencies that satisfy EPA criteria for public health protection are granted primary enforcement authority (primacy) for oversight and enforcement of drinking water regulations.

Source: Safe Drinking Water Act (40 CFR Parts 141-149)

oversight and enforcement of drinking water regulations. The SDWA was enacted in 1974 in response to increasing concern about the health effects of contaminants in drinking water. This Act not only established standards to reduce drinking water contaminants, it created an oversight and enforcement framework to ensure that public water system owners/operators would comply with the standards. The EPA was charged with implementing the SDWA through regulations published in the Code of Federal Regulations (CFR):<sup>8</sup>

- 40 CFR Part 141 includes the National Primary Drinking Water Regulations (NPDWR), which protect public health by creating risk-based maximum contaminant levels (MCLs) that establish legal thresholds for concentrations of substances allowed in public water systems under the SDWA. If drinking water exceeds an MCL, the owner/operator of the system is required by law to notify the public, the primacy agency and take appropriate protective measures.

<sup>7</sup>Public Law 93-523, Safe Drinking Water Act, as amended

<sup>8</sup>Title 40, Code of Federal Regulations, Parts 141-149, as amended



- 40 CFR Part 142 defines the implementation requirements for the NPDWR. This Part establishes a primary enforcement authority that, among other duties, conducts oversight and enforcement on behalf of the EPA to ensure timely correction of MCL exceedances.

Both of these CFR Parts were presented because MCLs and primacy are fundamental cornerstones that establish the quality of drinking water in the United States. To meet SECNAV's 2009 imperative, these topics must be understood and implemented along with other primacy agency responsibilities. In addition to MCLs, the other primacy agency responsibilities (listed in the text box "Primacy Agency Responsibilities") will be discussed in different contexts throughout the rest of the special study. These responsibilities are directly related to the oversight and enforcement that is necessary to deliver quality drinking water to U.S. standards. This special study will discuss the deficiencies that exist related to either the nonexistence or inadequate implementation of primacy responsibilities necessary to deliver water at Navy overseas installations to meet U.S. drinking water standards.

#### **Primacy Agency Responsibilities**

- Establish contaminant limits that are no less stringent than EPA regulations.
- Maintain an inventory of public water systems in their jurisdiction.
- Conduct sanitary surveys.
- Adopt and implement procedures for enforcement of regulations.
- Certify laboratories that will analyze water samples.
- Ensure new or modified water systems comply with NPDWR.
- Enforcement authority to ensure full compliance with NPDWR.
- Right to enter and inspect water system facilities.
- Require systems keep records and submit periodic reports.
- Require systems to notify the public of a violation.
- Assess penalties for violating regulations or public notification requirements.

Source: Safe Drinking Water Act (40 CFR Part 142, Subpart B)

#### **How Can a Primacy Agency Model Work for Navy Overseas Drinking Water?**

NAVINSGEN recognizes that Navy overseas drinking water is not regulated by the EPA. However, the SECNAV's 2009 imperative states that Navy personnel will receive the same quality of drinking water at overseas installations as they receive in the United States. In our evaluation, the primacy agency model with its impressive 39-year history of success is the most appropriate framework to meet the 2009 imperative. A component of this model is the EPA extending its oversight and enforcement authority to states that demonstrate they can meet specific primacy agency requirements. With the exception of Wyoming, every state has primacy for their drinking water systems. Drinking water systems in Wyoming, Washington D.C. and U.S. territories (e.g., Guam) rely on primacy authority administered directly by EPA. The

delegation of primacy to individual states has been successful and demonstrates that states can meet the SDWA while still maintaining autonomy to implement their program in a manner that is appropriate for their particular state. Water systems in the U.S. are primarily governed by oversight and enforcement that reside within their respective states and comply with all EPA requirements. Therefore, the water systems do not directly fall under the governance of the EPA. This primacy agency framework is appropriate and applicable to the Navy overseas water program where the Navy's program is not governed by the EPA, yet the Navy is required to meet U.S. water quality standards. By adopting the primacy agency model, the Navy can implement oversight and enforcement responsibilities required to meet SECNAV's 2009 imperative with confidence that the model is flexible enough to address various needs at overseas water systems (e.g., FGS).

Of note, federally owned water systems in the United States are not exempt from direct EPA or state primacy agency requirements as Navy owned/operated water systems in the United States must comply in **exactly the same manner** as other regulated U.S. water systems. These Navy water treatment owners/operators (CNIC/NAVFAC) must submit water quality data, operational records, public notifications and consumer confidence reports to primacy agencies and demonstrate compliance with SDWA regulations. As discussed in the next section, Navy owned/operated water treatment systems in the United States must correct deficiencies identified in periodic sanitary survey inspections conducted by the primacy agency. Deficiencies identified during these independent third-party surveys must be promptly addressed to avoid enforcement action. Uncorrected deficiencies may constitute "knowing and willful" violations and could be considered serious legal offenses subject to fines and penalties.<sup>9</sup> In some cases, civil/criminal prosecution can be initiated against individual owners/operators for negligence or failure to take action to correct deficiencies. Enforcement authority is one of a primacy agency's most compelling tools. An example of recent EPA enforcement action taken against the Navy is provided in Section 1.2 of this chapter. Together, this current discussion and the example indicate the importance of implementing a primacy agency to provide the same quality of drinking water at Navy overseas installations as Navy personnel receive at Navy installations in the United States. The quality of water in the United States is directly related to the oversight and enforcement of primacy agencies. By implementing a primacy agency for Navy overseas water systems, the Navy can eliminate the two separate qualities of water that currently exist for Navy personnel stationed in the United States versus Navy overseas installations, subsequently

<sup>9</sup>42 USC 300 - Sec. 300g-3, Enforcement of Drinking Water Regulations

reducing and eventually eliminating the dichotomous health risks associated with these two separate qualities of water.

To complete the discussion of how a primacy agency can work for the Navy, the current regulation of Navy overseas water systems must be addressed. Navy water systems operating overseas must comply with country-specific drinking water standards defined in the FGS and also comply with Navy regulations. The FGS are supposed to reflect the most stringent requirement in a side-by-side comparison of applicable U.S. and host country requirements. There is a correlation that has often been communicated to Navy personnel overseas that the adoption of the most stringent requirements leads to the best protection for our people. This concept is inconsequential when considering the high number of uncorrected deficiencies that have been documented in sanitary surveys over 10 years, inspection reports and recent One-Day Assessments (discussed in detail in Chapter 2), which all indicate that overseas water systems are not in compliance with the FGS.

While FGS drinking water standards are similar to the NPDWR (40 CFR Part 141), other FGS requirements are often subjective and lack any enforcement process or consequences for noncompliance. Further, the FGS do not address critical primacy (independent oversight and enforcement) requirements of 40 CFR Part 142. More specifically, the FGS do not assign or address the role of primacy agencies; oversight is the responsibility of each service component. This creates a contrast to the requirements that Navy installations must follow in the United States as water quality data, operational records, public notifications and consumer confidence reports are not submitted to a primacy agency to ensure Navy overseas drinking water systems meet the FGS. Furthermore, no organization is responsible to ensure deficiencies are corrected within a reasonable period of time. NAVINSGEN considers the lack of oversight and enforcement authority (primacy) within the FGS as a main cause for noncompliance. The 2009 imperative is based on a system that assigns oversight and enforcement authority (primacy) and maintains these functions separately and independently from management and operations of drinking water systems. NAVINSGEN concludes that the Navy must consider 40 CFR in its entirety; just considering the MCLs in 40 CFR Part 141 is not sufficient to meet SECNAV's 2009 imperative. This concept will be discussed as appropriate in this special study.

Besides complying with FGS and SECNAV's 2009 imperative, there is an expectation that the Navy will follow its own regulations and instructions governing drinking water systems. As

shown by recent Congressional interest<sup>10</sup> concerning drinking water quality at Norfolk Navy installations, there is potential for similar or greater scrutiny over the Navy's noncompliance with SECNAV's 2009 imperative or multiple Navy instructions that require FGS compliance. There are a significant number of inspection reports, sanitary surveys and operator logs that indicate overseas installations are not following Navy regulations.

## **1.2 Navy Overseas Drinking Water Program Oversight Cannot Effectively Correct Deficiencies**

Chapters 2-4 will discuss deficiencies that remain uncorrected and are allowed to remain uncorrected because there is no third party separate from the owners/operators of the drinking water systems that has oversight and enforcement authority (primacy). A management-by-committee system of water quality boards shares oversight and management functions among the owners/operators of the drinking water systems. Because this management framework has oversight responsibilities, the management framework will be discussed here and also in Chapter 2, which will discuss management of the Navy's overseas drinking water program. This is a necessary approach considering that the current managerial framework combines oversight and management and the lines become blurred between the two functions. This section will discuss why the oversight structure of the Navy's overseas water program is not equal to primacy and how this ineffective oversight structure allows deficiencies to remain uncorrected.

### **The Navy's Current Oversight Does Not Equal Primacy**

The Navy's current oversight structure has failed to meet SECNAV's 2009 imperative "...that Navy personnel receive the same quality of drinking water at overseas installations as they do in the United States."<sup>11</sup> The Navy has not met CNO's direction "...to establish protocols and procedures to ensure our overseas installations have drinking water that meets or exceeds the United States water quality standards."<sup>12</sup> A main contributor to this failure has been CNIC/NAVFAC management oversight initiatives that cannot meet primacy agency requirements for independent oversight and enforcement; primacy requires the separation of oversight and enforcement from operations. The enclosure to CNO's memorandum states "...Echelon III water quality oversight group will essentially provide the same third-party independent oversight role that the EPA does for CONUS installations."

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<sup>10</sup>Senator Warner letter, 4 April 2013

<sup>11</sup>SECNAV memo, 28 January 2009

<sup>12</sup>CNO memo, 1 April 2009

NAVINSGEN has observed that this never occurred in the last four years and is not possible within the current managerial framework. The Echelon III group did not provide the same independent oversight role that EPA requires in the United States. The organizations providing oversight are also the owners/operators of overseas drinking water systems. This approach is fundamentally flawed because there is no separation between a regulating primacy agency and owners/operators to prevent potential conflicts of interest; EPA recognizes this crucial necessity to avoid inherent conflicts of interest as indicated in the text box on this page.

**Primacy - The Separation of Oversight and Enforcement from Operations**

Washington D.C. is one of two jurisdictions in the contiguous United States that does not have primacy under the Safe Drinking Water Act. To ensure independent oversight the EPA serves as the primacy agency *regulating* water systems and the owners/operators of *regulated* systems to prevent potential conflicts of interest.

The self-regulating system of oversight chosen by CNIC, NAVFAC and BUMED has a four-year history of not meeting SECNAV's 2009 imperative. During this period, there has been a lack of enforcement for not correcting documented short and long-term deficiencies that continue to increase public health risks. The "Navy Scorecard" (Figure 1-1) rates the Navy-wide progress of overseas drinking water programs in accomplishing 40 CFR Part 142 primacy agency

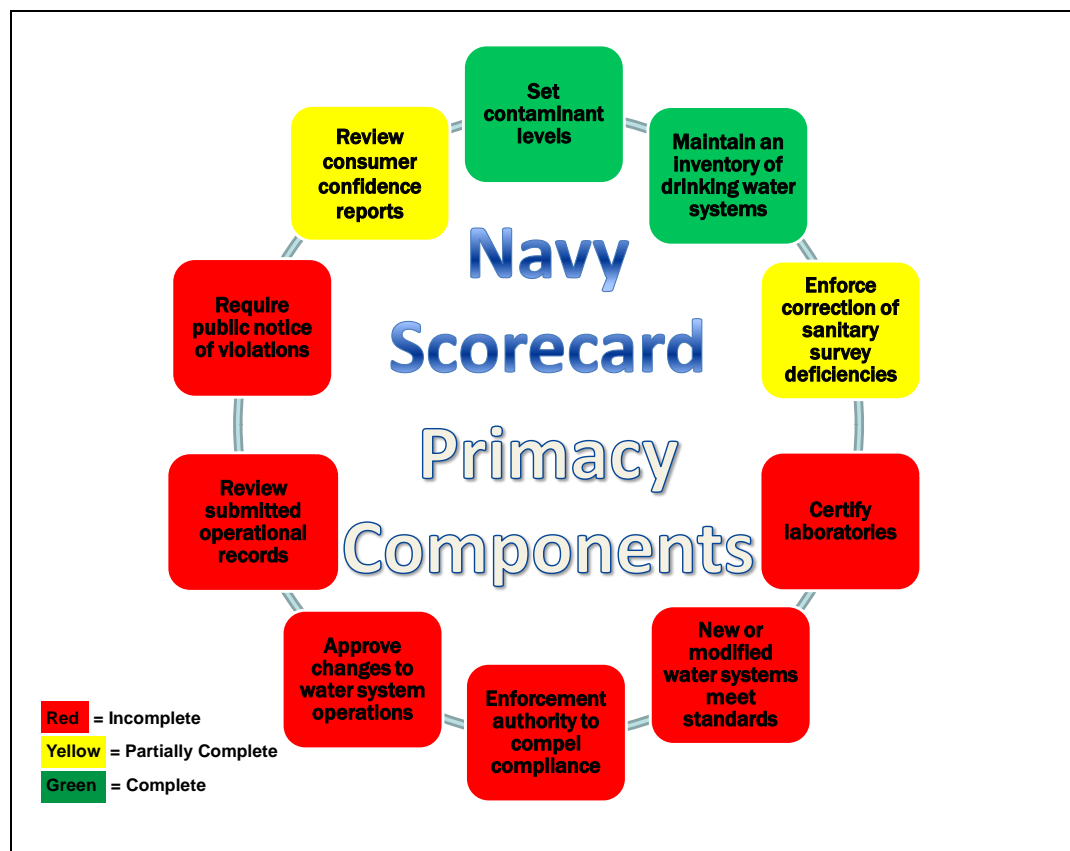


Figure 1-1. Most primacy components at Navy overseas installations are incomplete. Source: NAVINSGEN, July 2013

responsibilities. The Navy meets the primacy components for setting contaminant levels and maintaining an inventory of drinking water systems. All other primacy components, shown in yellow and red in Figure 1-1, are partially complete or incomplete at Navy installations overseas. For example, the sanitary surveys are not always independent and installations do not take prompt corrective action to fix deficiencies. Additionally, Navy installations are not required to submit routine operational records or logs for technical review to verify compliance.

Because most primacy agency components have not been implemented, even after four years following SECNAV's imperative, not a single Navy overseas water system (including leased properties and purchased water) would meet U.S. compliance standards. Furthermore, until the Navy implements these requirements, Sailors, their families and Navy employees will continue to receive two different qualities (and health risks) of drinking water depending on whether they are stationed in the United States or overseas; the Navy assumes the risk associated with this dichotomy.

NAVINGEN presented information concerning the state of overseas drinking water in a brief<sup>13</sup> to CNIC, NAVFAC and BUMED in October 2012. A significant portion of the brief discussed the lack of a primacy agency, the current management-by-committee framework (discussed further in Chapter 2), long-standing deficiencies and the immediate need for the Navy to employ risk-reduction strategies for overseas drinking water. No managerial actions have occurred since that brief to establish a primacy agency and NAVINGEN has continued to evaluate the impact of instructions, policies and actions to influence oversight of Navy overseas drinking water systems.

The new instructions<sup>14</sup> and OPNAV N4 guidance<sup>15</sup> assigned some new roles (e.g., executive agent) and implemented new managerial tools but none of these changes include the methodology proven to improve regulatory compliance in the United States - independent third-party oversight. Instead, all three commands have become further entrenched in their roles under the current managerial framework. There has been a "reshuffling" of some roles and responsibilities, but no fundamental changes from what was presented in 2009.<sup>16</sup> NAVINGEN recognizes the latest round of instructions, regulations and policies were written to establish the same principles required by the imperative from SECNAV and directive from CNO in 2009. In our view, the current managerial framework to manage overseas drinking water is incapable of

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<sup>13</sup>NAVINGEN brief to CNIC, NAVFAC and BUMED, Overseas Potable Water, 9 October 2012

<sup>14</sup>CNICINST 5090.1, U.S. Drinking Water Quality Standards for U.S. Navy Installations Overseas, 4 February 2013

<sup>15</sup>OPNAV N4 letter, 4 February 2013

<sup>16</sup>CNO memo, 1 April 2009

delivering drinking water that meets U.S. standards and FGS and the Navy will not achieve this until a primacy agency is implemented.

### **How Deficiencies Remain Uncorrected in the Current Oversight Program**

Deficiencies remain uncorrected because there is no independent oversight and enforcement authority (primacy) for the Navy's overseas water program. A primacy agency identifies deficiencies in a water system by conducting a sanitary survey, which is a comprehensive assessment of all components of a water system. This assessment documents the capabilities of water system sources, treatment, storage, distribution network, operation and maintenance and overall management to validate that safe drinking water is provided to consumers. Sanitary surveys identify existing and potential deficiencies that must be corrected within a specified period of time. Failure to correct these deficiencies is considered a violation that may require public notification or result in enforcement actions by the primacy agency.

In the United States, sanitary surveys are mandatory and are a primary tool utilized by the primacy agency for oversight and enforcement. The sanitary surveys are never conducted by the owners/operators of water systems in the United States because of inherent conflicts of interest. The Navy does not have a consistent process for conducting sanitary surveys at overseas installations. Some regions/installations conduct sanitary surveys with CNIC, NAVFAC and/or BUMED personnel while others utilize independent third-party contractors. The periodicity of sanitary surveys is inconsistent across the entire program. What remains consistent for all water systems that receive the sanitary surveys is the significant number of deficiencies that remain uncorrected after identification in the sanitary survey. Some of these deficiencies have remained uncorrected for over a decade. The manner in which the Navy conducts and utilizes sanitary surveys is not consistent with SECNAV's 2009 imperative.

The following example illustrates a difference in effectiveness regarding sanitary surveys, oversight and enforcement authority between the independent primacy model in the United States and the Navy's overseas self-regulating oversight model. As the primacy agency for Washington D.C., the EPA conducted a sanitary survey at Joint Base Anacostia-Bolling in 2008 that documented several deficiencies including a flooded vault. A subsequent sanitary survey, conducted in 2011, identified some of the same deficiencies including the same flooded vault.



Under its authority as the primacy agency, the EPA issued an enforcement action to the Navy (and the Washington Suburban Sanitary Commission as co-owner) that required Joint Base Anacostia-Bolling to submit and implement a plan to correct the flooded vault. The consent order also required the Navy to notify customers about the violation (and other violations) and submit quarterly reports to the EPA to monitor completion of all corrective actions. The Navy's failure to take prompt, corrective action following the sanitary survey in 2008 resulted in EPA legal action and negative publicity (Figure 1-2).

### EPA Orders Military Base And WSSC To Fix Water Problems

By: Sabri Ben-Achour // September 30, 2012

The Environmental Protection Agency is requiring the Navy and the Washington Suburban Sanitary Commission to fix problems with the drinking water system at Joint Base Anacostia-Bolling (JBAB).

JBAB has its own drinking water facility. The military owns the water, and the Washington Suburban Sanitary Commission owns the pipes; they share responsibility. Much like the dishes in a group home, some things don't get done when responsibility is shared.

In this case, it's fixing leaking pipes. Karen Johnson is chief of Groundwater and Enforcement Branch for the EPA in this region of the country.

"We weren't sure whether the pipes were leaking water out, or leaking water in, or groundwater infiltrating," says Johnson.

**"Special metering pits were repeatedly flooding and hadn't been fixed for years."**

Figure 1-2. EPA requires Navy and Washington Suburban Sanitary Commission (WSSC) to correct flooded vaults at Joint Base Anacostia-Bolling. Source: Washington Post, 30 September 2012

A sanitary survey conducted at NAS Sigonella in 2001 documented the same deficiency (a flooded vault) found by the EPA at Joint Base Anacostia-Bolling. Figure 1-3 is a photograph of a flooded vault at NAS Sigonella taken eight years after the deficiency was identified in the 2001 sanitary survey. In the United States, sanitary surveys categorize deficiencies based on

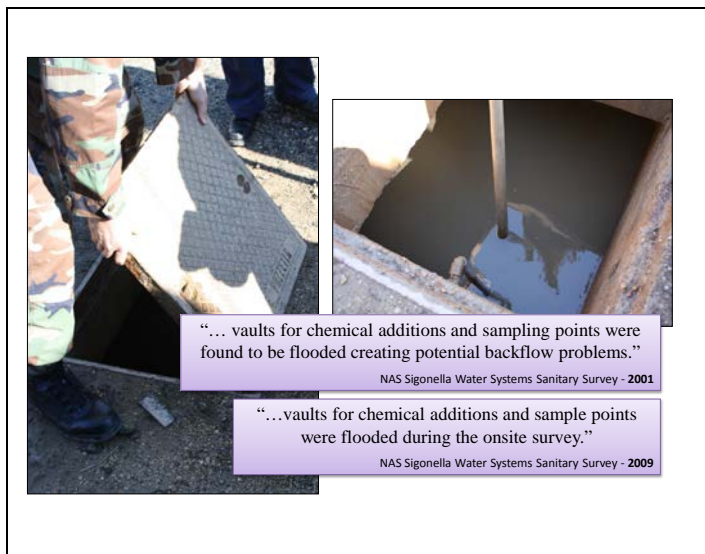


Figure 1-3. Flooded vault at NAS Sigonella that remained uncorrected for at least eight years. Source: NAVINSGEN, 2009

public health impact. Both the flooded vaults at Joint Base Anacostia-Bolling and NAS Sigonella are considered "significant deficiencies" according to EPA criteria and "require the system [owners/operators] to take *immediate* corrective action..."<sup>17</sup> When the Navy failed to take action at Joint Base Anacostia-Bolling, the primacy agency issued an administrative consent order forcing the Navy to take corrective action to protect the water system.

Significant deficiencies at NAS Sigonella and other overseas water systems remain uncorrected for years because the owners/operators have no accountability to an independent primacy agency.

<sup>17</sup>U.S. Environmental Protection Agency, Guidance Manual for Conducting Sanitary Surveys of Public Water Systems: Surface Water and Ground Water Under the Direct Influence (GWUDI), 4-4, 4-7, April 1999

## Is a “Corrected” Deficiency Actually Corrected?

Another example that indicates the Navy’s oversight of overseas drinking water systems does not equal primacy involves the process of correcting documented deficiencies. NAS Sigonella’s 2009 sanitary survey “...found deficiencies at all five water systems that can adversely affect the ability to consistently deliver safe drinking water.”<sup>18</sup> In response, NAS Sigonella monitored corrective action progress in a plan of action and milestones (POA&M). In August 2010, NAS Sigonella’s POA&M reported 43 corrective actions complete and 31 still in-process. An excerpt from this POA&M, left side of Figure 1-4, lists actions for records, calibrations, repairs to leaks and equipment labeling. Despite being recorded as complete, many of these deficiencies remained uncorrected for years. For example, in October 2012, NAVFAC Engineering and Expeditionary Warfare Center (EXWC) conducted an inspection<sup>19</sup> of NAS Sigonella water treatment plants and documented that deficiencies marked as “complete” in the POA&M were uncorrected. An excerpt from EXWC’s inspection report on the right side of Figure 1-4 clearly shows deficiencies listed as complete were either not corrected or process changes to prevent their recurrence were not implemented.

Sanitary Survey PLAN OF ACTION AND MILESTONES					
LEGAL & OTHER REQUIREMENTS		STATUS/ACTION PLAN/MILESTONE			
Media	FGS Citation/ Sanitary Survey Description	Proposed /Planned Corrective Action	Expected Final Date of Compliance or Corrective Action	STATUS UPDATE	Comments
DW	Maintain records of chemical usage and raw water quality and log them electronically along with other operational data. Modify the SCADA system to facilitate data retrieval and backup.	Administrative or minor maintenance action.	Complete by Q-2, CY-10	Proposed date of completion moved to CY-11DR051010	
DW	Implement a comprehensive operational monitoring and record keeping program, starting with the consolidation and QA/QC of the data and information in the existing records.	Administrative or minor maintenance action.	Complete by Q-4, CY-10 DR 051010	CY-10 DR 051010	
DW	Calibrate probes on a routine schedule and tag them with last calibration date. Provide operators with required training, equipment and reagents to perform calibration.	Administrative or minor maintenance action.	Complete by Q-2, CY-10		
DW	Repair all leaking chemical feed system piping and fittings immediately upon detection	COMPLETE		COMPLETE Updated 05-10 TB	
DW	Label flow direction, type of flow inside the pipe, maximum pressure and the process equipment.	Administrative or minor maintenance action.	Complete by Q-2, CY-10		COMPLETE Updated 08-10 TB

**NAVFAC EXWC Notes  
October 2012 Inspection**

“...you need to fill out more datasheets.” “You should be tracking pressures, flows, conductivity, pH, turbidity, SDI etc.” “DATA, DATA and more DATA will help you understand, define and adjust your operational needs.”

“Multimedia Filter-Sand Filters...No calibration has been done on the meters.”

Multiple signs of leaking noted in the report.

“EVERYTHING on the equipment needs to be labeled with its nomenclature...and direction of flow...”

Figure 1-4. Excerpt from NAS Sigonella’s Plan of Action in 2010, yet deficiencies still existed in 2012.

Source: NAS Sigonella, August 2010 and NAVFAC Engineering and Expeditionary Warfare Center, October 2012

<sup>18</sup> AH Environmental Consultants, Water Systems Sanitary Survey, NAS Sigonella, ES-2, October 2009

<sup>19</sup> NAVFAC EXWC memo, Inspection Notes for NAS I and NAS II Sigonella Water Treatment Plants, 4-10 October 2012

Self-reporting deficiencies as complete without independent third-party verification is an inherent conflict of interest that can lead to failures to correct violations. In the United States, primacy agencies conduct the independent oversight to verify correction of deficiencies. The absence of a primacy agency at overseas locations allows deficiencies to go undetected and unreported for years with potential adverse health outcomes to Navy personnel and families.

### **1.3 Recommendation for a Primacy Agency**

Any recommendation for a primacy agency requires an evaluation of Navy public health resources currently involved in the overseas drinking water program. Since NAVINSGEN's 2009 report recommended an oversight role for BUMED as the public health authority, this section is also an appropriate place to discuss that 2009 recommendation and the current recommendation to establish a primacy agency. Succeeding chapters will continue to evaluate the prioritization of protecting public health where appropriate. The primacy agency recommendation discussed at the end of this section will also include management recommendations since a primacy agency requires the separation of oversight and enforcement authority from management and operations.

#### **The Protection of Public Health is the Priority for a Primacy Agency**

A primacy agency has the priority of protecting public health above all other priorities in the delivery of drinking water to the public. The context of this statement can be included as part of a Navy instruction, mission statement, or by providing public health resources and services with a commitment to the protection of public health. However, having any or all of these elements does not necessarily equate to the actual prioritization that a primacy agency places on the protection of public health; this is reflective of the prioritization of public health within the Navy's overseas drinking water program. There are instructions, mission statements, resources and services that indicate various levels of public health priority within the program, but none of these efforts significantly approach the public health priority that is required to comply with SECNAV's 2009 imperative (and FGS) on a continuous basis. While the protection of public health is a consideration in the Navy overseas water program, currently, public health is not the priority of the program. This fundamentally flawed approach is a key contributing factor to why long-standing deficiencies remain uncorrected and the Navy has legacy issues that require a risk-reduction strategy (Chapter 4).

## Why is there a lack of public health priority in the Navy overseas drinking water program?

On a macro level, this question can be answered by discussing the current management-by-committee system of water quality boards' (discussed in detail in Chapter 2) member composition. The boards are staffed by water system owners/operators from CNIC and NAVFAC and have a BUMED representative that serves as an advisor. The composition and role of members significantly diminishes the priority of protecting public health in the current oversight and management of overseas water systems. BUMED's participation as an advisor to CNIC and NAVFAC (at all levels of overseas drinking water management) has not resulted in any significant increase in public health compliance in the operations of overseas drinking water systems.

In addition, CNIC and NAVFAC do not utilize public health professionals that are knowledgeable in public health issues related to drinking water, which means these commands are not providing public health experts to make decisions on these water quality boards. However, BUMED has an entire command dedicated to public health and a network of public health professionals worldwide at Navy installations. Yet, the role of BUMED public health professionals on these boards is advisory only. In 2013, there are no fundamental changes in the role of BUMED from what NAVINSGEN evaluated in 2009. In the 2009 overseas water summary report,<sup>20</sup> NAVINSGEN stated that:

*"BUMED plays a minor role of independently monitoring the potable water program overseas."*

*"Although BUMED is responsible for overseas public health issues, its preventive medicine personnel play only a small role in potable water management."*

Four years later, both of these statements are still accurate. The 2009 report consistently emphasized the lack of a public health priority within the overseas drinking water program as a primary root cause for many of the deficiencies in the overseas drinking water program. Since 2009, NAVINSGEN found very little evidence of corrective actions initiated and completed by BUMED to address the lack of public health priority and compliance. In addition, the health risks of not meeting SECNAV's 2009 imperative are prevalent because the Navy is still delivering drinking water to a lesser public health priority than Navy installations in the United States under a primacy agency model. This evaluation is self-evident given the high number of deficiencies identified in sanitary surveys, inspections and recent One-Day Assessments. NAVINSGEN concludes that the advisor role of BUMED in the overseas water program is not

<sup>20</sup>NAVINSGEN Summary Report to SECNAV, Overseas Potable Water Systems, 4,13 January 2009

sufficient considering their public health mission and the need to fix long-standing deficiencies in order to bring the program into compliance with SECNAV's 2009 imperative.

This view is not without its critics. As discussed previously in Section 1.2, BUMED (along with CNIC and NAVFAC) attended a NAVINSGEN brief in October 2012 and were notified of a NAVINSGEN follow-up special study to the 2009 report. Additionally that month, the Naval Inspector General released a “quick-look” discussing the findings of the September 2012 Europe Area Visit. The following are quotes from BUMED staff emails regarding NAVINSGEN findings and potential recommendations concerning a different role for BUMED:

*“I am actively looking for the IG quick-look for the likely case that we may have to push back on new BUMED responsibilities [with regards to] WRT potable water.”*

*“...the Navy IG team may recommend an oversight role for BUMED, BUMED and [Navy and Marine Corps Public Health Center] NMCPHC do not concur. Therefore, the guidance from NMCPHC will be not to recommend an oversight role for BUMED and NMCPHC, but to recommend an advisory role.”*

These emails provide some insight into the current culture regarding overseas drinking water despite the lack of progress in meeting SECNAV's 2009 imperative and being aware of numerous sanitary surveys, inspections, NAVINSGEN reports and recent One-Day Assessments that specifically identify deficiencies threatening public health of Navy personnel. “We are not the water czars” and “we are not water engineers” are additional characterizations that some personnel use to support their subordinate role as an advisor. In addition, some preventive medicine personnel (those not in favor of an increased role) have concluded that the absence of clinical disease or death at NAS Sigonella is proof that no significant public health issues regarding drinking water exist at that location despite the assessment of multiple sanitary surveys that indicate there are significant public health issues. This conclusion is not consistent with the practice of preventive medicine and indicates a fundamental lack of understanding or willful disregard for the purpose of the SDWA, FGS and the priority of public health applied to drinking water. A perception has developed that objective professional judgment is being influenced by the desire to justify the preferred role as an advisor. Beyond all discussion, the Navy's overseas drinking water program has long-standing deficiencies and is not meeting SECNAV's 2009 imperative because of the de-facto low priority that the protection of public health has in the program. We conclude that the role of advisor is inadequate to resolve the current situation in which the Navy finds itself. There is no single command that is adequately providing the necessary public health priority to correct long-standing deficiencies and meet SECNAV's 2009 imperative.

NAVINSGEN has observed that secondary effects have evolved from this passive approach taken by BUMED in implementing their role as the advisor. These secondary effects have adversely affected the ability of BUMED to function in the role of advisor as BUMED has internally matched public health resources and services to the passive advisor role provided within the Navy's overseas drinking water program. For example, BUMED does not provide adequate internal oversight to ensure that a consistent level of experience, knowledge and training resides within their overseas installation preventive medicine personnel. The inadequate quality of overseas preventive medicine personnel leaves unacceptable gaps in public health compliance of drinking water systems, even in the passive advisor role.

Another example is the manner in which the “medical surveillance for the drinking water program” is implemented. This program is not tied to installation decision making processes at some installations while the results from this medical surveillance program are substituted for compliance monitoring at other installations (a violation of Navy regulations). BUMED is familiar with laboratory accreditations, method validations and analytical protocols that must be observed to deliver clinical medical services; yet the “medical surveillance for the drinking water program” is lacking almost all of the critical core elements (e.g., accreditation and certification) that govern similar BUMED sampling and analytical laboratory programs. The deficiencies of the “medical surveillance for the drinking water program” are a high risk for not providing adequate public health surveillance for the Navy. NAVINSGEN concludes that BUMED’s stated role of advisor is a contributing factor to the deficiencies discussed in this paragraph and ultimately the lack of prioritizing public health in the Navy's overseas drinking water program.

NAVINSGEN's 2009 report recommended that BUMED take the role as the public health authority and provide oversight at overseas installations. Because of the lack of progress within the Navy overseas drinking water program over the last four years, noncompliance with SECNAV’s 2009 imperative and BUMED’s reluctance to accept a role greater than advisor, NAVINSGEN concludes that the 2009 recommendation for oversight provided by BUMED as the public health authority is no longer sufficient. An independent primacy agency (that conducts oversight and enforcement) must be established to separate oversight and enforcement from the management and operations (CNIC, NAVFAC and BUMED) of overseas drinking water systems.



NAVINSGEN has evaluated the oversight and management framework that was established by CNIC, NAVFAC and BUMED over the last four years. This framework simply does not provide independent oversight and enforcement authority (primacy agency); the current management framework is recognized as a management-by-committee approach to managing overseas drinking water. During the course of this special study, NAVINSGEN observed deficiencies, violations of regulations, lack of knowledge, inadequate training and experience, conflicts of interest and resistant cultures at various levels that preclude CNIC, NAVFAC or BUMED from serving as the Navy's primacy agency. NAVINSGEN concludes that oversight, enforcement and management are grossly inadequate within the current framework; none of the three organizations provide the necessary priority for public health within the overseas drinking water program that our people deserve. NAVINSGEN recommends that the primacy agency (oversight and enforcement authority) is established as a SECNAV Primacy Agency Office (within the Assistant Secretary of the Navy (Energy, Installations and Environment) [ASN (EI&E)]) that could physically reside at the Navy and Marine Corps Public Health Center (NMCPHC).

Figure 1-5 is a diagram of the proposed organizational structure to ensure separation of oversight and enforcement authority (through the formation of a primacy agency) from management and operations of overseas drinking water. This organization of the primacy agency will allow immediate access to all the multidisciplinary public health resources at NMCPHC (permitting a small staff to man the SECNAV Primacy Agency Office).<sup>\*</sup> Due to the extent of

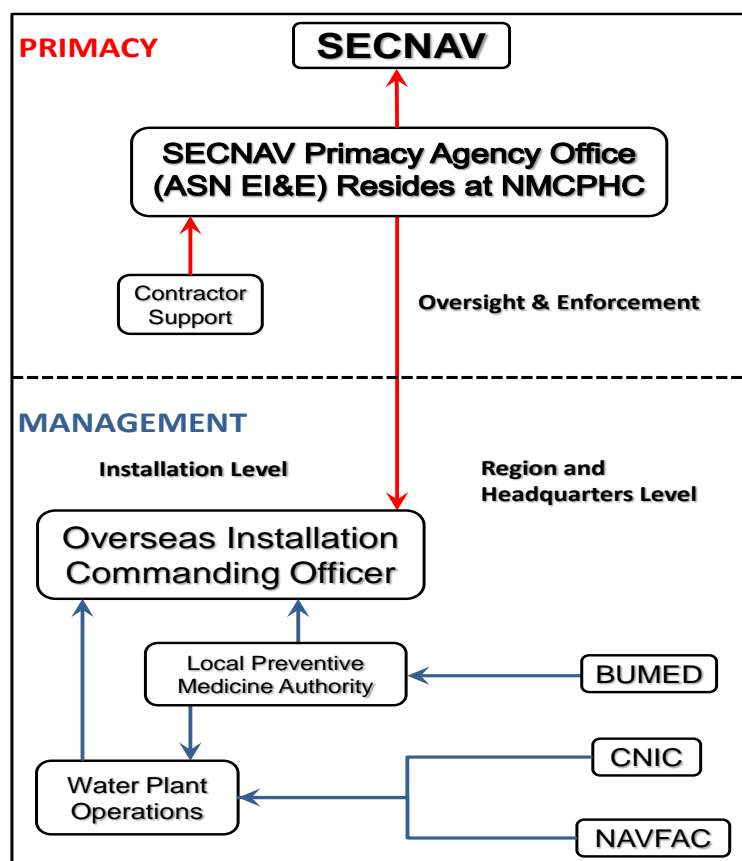


Figure 1-5. Proposed SECNAV Primacy Agency Office residing at the Navy and Marine Corps Public Health Center. Source: NAVINSGEN, July 2013

<sup>\*</sup>As an example, the Commonwealth of Virginia has 115 people in the Office of Drinking Water (primacy office) to oversee 2727 public water systems. The Navy has 41 overseas installations in different countries worldwide.



deficiencies, it will take significant investment of personnel and resources to bring installations into compliance. Initially, the Primacy Agency Office will require sufficient staff to develop and implement an oversight and enforcement program; this is further compounded by the wide range of host nation laws, FGS and unique geographic factors. The Primacy Agency Office will require contractor technical support and assistance in conducting independent third-party sanitary surveys (funding through the owners/operators of the water systems) and the sanitary surveys will drive oversight and enforcement actions for correcting deficiencies; this process is very similar to the process followed for Navy installations within the United States.

As in the United States, oversight and enforcement directly from the SECNAV Primacy Agency Office to the installation commanding officer (ICO) is essential. Each host country has unique FGS; therefore, the ICO is in the best position to manage the unique compliance requirements and is recognized as the responsible official. The ICOs are accountable for water operations at their respective installations and would receive direct oversight and enforcement authority from the SECNAV Primacy Agency Office. We understand the Navy may internally decide that region commanders should have accountability for Naval installations; NAVINSGEN determined at overseas locations the ICO should be accountable to the primacy agency for water quality regardless of the Navy's normal structure for internal accountability. The level of detail for management and operations of water systems is diminished at the region commander level.

An effective overseas drinking water program will require a robust level of effort (supporting the ICO) at the installation level. Local preventive medicine personnel must have a direct line to the ICO to ensure public health is not relegated to a lesser role. These recommendations recognize the need for BUMED to take a greater role than the current subservient advisor role on boards related to the management of overseas drinking water systems. BUMED's role is not to be confused with owning or operating the water systems; they are responsible to ensure the management of overseas drinking water occurs always with the protection of public health as the priority for consideration above all other priorities.

Equally important in this organizational structure is the requirement for a detailed level of management that focuses on installation water plant operations (e.g., operator training, operating procedures and operating logs that drive corrective measures). Region and headquarters commands (CNIC, NAVFAC and BUMED) share responsibility for providing management, oversight and resources to effectively own and operate water systems. No system will be successfully implemented until these three commands prioritize overseas drinking water to a significantly higher level than NAVINSGEN has observed for many years. All levels of these

organizations require more detailed, public health compliance-based cultures to meet SECNAV's 2009 imperative. NAVINGEN has observed that the deficiencies of the Navy's overseas drinking water program have existed for well over a decade. The legacy issues created by these long-standing deficiencies significantly increase the Navy's risk of future liability and reputation risk. Furthermore, the current management framework for drinking water at Navy overseas installations is significantly different than Navy installations in the United States, creating two distinct health risks for our people. The Navy assumes the risk of this dichotomy. NAVINGEN recommends implementation of a primacy agency as the appropriate framework to ensure the protection of public health and the delivery of safe drinking water.

### **Recommendations:**

- 1-1. SECNAV provide the manpower and resources required to establish the SECNAV Primacy Agency Office within the Assistant Secretary of the Navy, Energy, Installations and Environment (ASN EI&E) that could physically reside at NMCPHC. The SECNAV Primacy Agency Office would have immediate access to all the multidisciplinary public health resources at NMCPHC.
- 1-2. SECNAV direct the Primacy Agency Office to implement an oversight and enforcement system that models U.S. EPA primacy agency components and ensures Navy overseas installation drinking water programs meet SECNAV's 2009 imperative, and comply with DoD, FGS and Navy instructions (Figure 1-5).
- 1-3. CNO direct CNIC, NAVFAC and BUMED to ensure that management and operations of the overseas drinking water program occur with protecting public health as the priority and meet all applicable instructions and requirements.
- 1-4. CNO direct BUMED to develop a plan that aligns their public health mission with the current needs of the Navy to meet the public health compliance shortfalls within the overseas drinking water program; this will include ensuring that management and operations of the program occur with protecting public health as the priority of the program.
- 1-5. CNO direct BUMED to ensure a consistent level of experience, knowledge and training resides within their overseas installation preventive medicine personnel. Plans for implementation and routine progress shall be forwarded to the SECNAV Primacy Agency Office for their approval.
- 1-6. CNO direct BUMED to ensure the "medical surveillance for the drinking water program" has program elements (e.g., training, sampling methods and analytical methods) that are consistent with accredited clinical sampling and laboratory programs within BUMED. Direct BUMED to conduct internal oversight on this program and these reports shall be forwarded to the SECNAV Primacy Agency Office for their approval.

## Chapter 2: Management of Overseas Drinking Water Systems

### 2.0 Introduction

Chapter 1 concluded with a recommendation to create a SECNAV Primacy Agency Office that would be responsible for oversight and enforcement while CNIC, NAVFAC and BUMED would retain responsibility for management and operations of overseas drinking water systems. This separation of oversight and enforcement authority from management and operations of the water systems is an essential component of the SDWA (refer to Chapter 1 discussion about Parts 141 and 142 of the SDWA) and conspicuously absent from the Navy's current management-by-committee framework. This chapter will evaluate the current management-by-committee framework that governs the Navy's overseas drinking water program. First, there will be a discussion of the structure and function of this framework, followed by key examples that indicate the ineffectiveness of the current management framework. More directly, the examples are indicators of the inability of this management framework to ensure the protection of public health of Navy personnel is the priority of the Navy's overseas drinking water program. As in Chapter 1, we will continue to discuss oversight and management where appropriate, because the two functions become blurred in this current management framework.

### 2.1 Water Quality Board Management-by-Committee Framework is an Ineffective Mixture of Oversight and Management

In Chapter 1, we concluded that the Navy's current oversight of the overseas drinking water program was not equivalent to primacy and the management-by-committee managerial framework does not provide the necessary independent oversight role that EPA requires in the United States. We further evaluated the Navy's progress for implementing primacy components (Figure 1-1). Many of these primacy components are ineffectively implemented because they are not governed by a primacy agency. Instead these primacy components have inappropriately become management functions within the current framework and most of the primacy components have not been incorporated at all.

CNIC's newest water instruction<sup>21</sup> strives to implement some aspects of 40 CFR Part 141 including MCLs, but does not include the SDWA 40 CFR Part 142 primacy components (see Chapter 1). This instruction will be followed in the future by two more CNIC instructions that establish a "Certificate to Operate" procedure and the "regulatory-type" framework for the overseas drinking water management program. As stated in Chapter 1, these instructions will

<sup>21</sup>CNIC Instruction 5090.1, 4 February 2013

present a “reshuffling” of some roles and responsibilities, but will not fundamentally change the managerial approach to meet SECNAV’s imperative. When these instructions are released, the Navy will still not have implemented key components of the SDWA, and will not have the organizational structure necessary to meet SECNAV’s 2009 imperative.

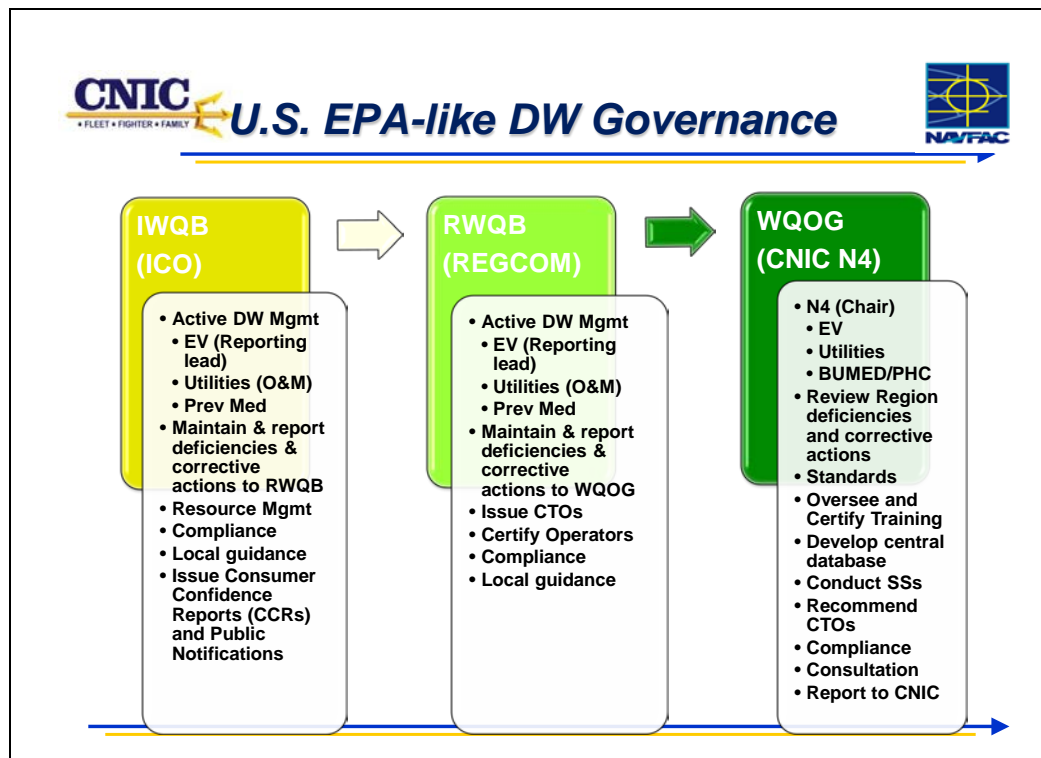


Figure 2-1. CNIC’s system of water quality boards does not provide U.S. EPA-like governance.  
Source: CNIC Overseas Drinking Water Brief, 24 October 2012

Figure 2-1 represents CNIC’s version of EPA-like governance using a management-by-committee tiered water quality board system. From the most fundamental view, this system cannot provide EPA-like governance because the owner/operators of the water systems regulate themselves. This is an obvious conflict of interest that EPA does not allow. Contrast Figure 2-1 with Figure 1-5, which separates owners/operators of water systems from oversight and enforcement. Also, primacy components from 40 CFR Part 142 of the SDWA that were discussed in Chapter 1 are not included as responsibilities for the boards in Figure 2-1. Conversely, some of the water quality board responsibilities include management functions of overseas water systems that are not a part of primacy. Of note is the “compliance” responsibility, which is a shared responsibility for all three boards in Figure 2-1. NAVINSGEN has observed that responsibility for multiple oversight and management issues (including compliance) is greatly diluted in this water quality board system. More importantly, there is not

#### Responsibility

“Unless you can point your finger at the man who is responsible when something goes wrong, then you have never had anyone really responsible.”

Source: Admiral Hyman G. Rickover, USN

a single entity that ensures the protection of public health is the priority for the overseas drinking water program.

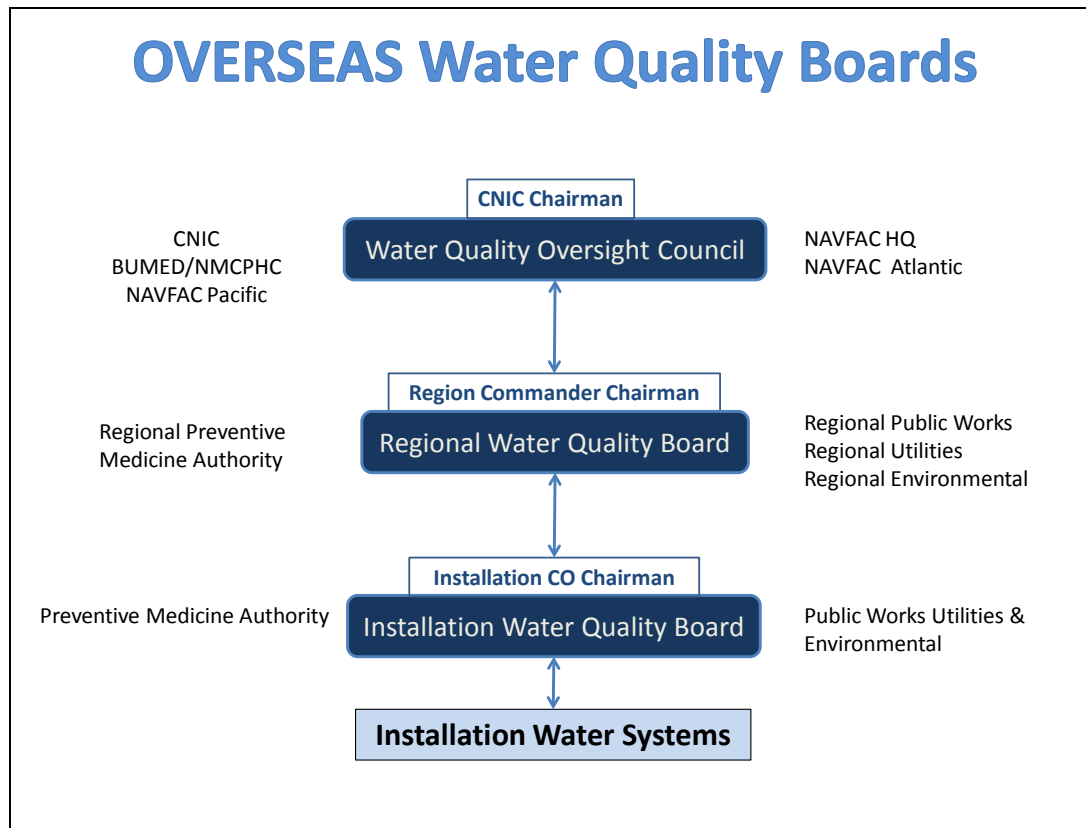


Figure 2-2. Management of overseas drinking water systems involves multiple water quality boards and membership from various stakeholders. No single group ensures the protection of public health is the priority of the overseas drinking water program. Source: NAVINGEN, July 2013

Figure 2-2 is NAVINGEN's depiction of the management-by-committee framework that governs the overseas drinking water program. Each board is comprised of stakeholders/members at the respective water quality board level. The Navy's management-by-committee framework involves three water quality boards: Installation Water Quality Board (IWQB), Regional Water Quality Board (RWQB) and Water Quality Oversight Council (WQOC.)<sup>\*</sup> This system (with some variations over time) has been in existence since drinking water management boards were established in the European theater in 2007. Two years after this system began, a NAS Sigonella sanitary survey<sup>22</sup> noted the water quality board system:

- Appears to be a good coordination tool, but is not an authoritative oversight body.
- Lacks planning and management for water systems which adversely affects performance.
- Lacks an effective follow-up process.
- Is poorly attended by stakeholders.

<sup>\*</sup>The Water Quality Oversight Group (WQOG) was renamed as the WQOC and the terms are used interchangeably in this special study.

<sup>22</sup>AH Environmental Consultants, Sanitary Survey, P-12, October 2009

While these four findings were specific to NAS Sigonella in 2009, as part of this study NAVINGEN evaluated the water quality board system and found that all four findings are valid for the entire Navy overseas drinking water program. Of particular interest, are the first two observations that address management and oversight. The quote in the text box offers insight to management and oversight problems that exist in this management-by-committee framework. The “confusion” to which the quote refers is an inherent consequence of this management framework when applied to meeting U.S. drinking water standards at overseas installations. This tiered management approach that combines oversight and management requires a great deal of coordination, instructions, policies and “buy in” of all stakeholders to accept their appointed roles. In our opinion, no appointment of executive agents, no new instructions written to indicate how water quality boards should interact, or changing the roles, responsibilities or composition of stakeholders will ensure this management framework is capable of meeting SECNAV’s 2009 imperative. This management framework is fundamentally flawed in its design for the application of combining oversight and management for the overseas drinking water program. The relative potability of drinking water before and after the SDWA is evidence that supports this opinion; the SDWA requires a separation of oversight and enforcement from management/operations (the water owners/operators).

#### Management-by-Committee is Confusing

“Commander, Navy Region, EURAFSWA’s fundamental goal is delivering potable water to service members and their families. Unfortunately, **confusion grows** when **water quality stakeholders at many levels cannot agree** on science, testing, reporting, and lines of authority related to the provision of potable water at installations in our AOR. This group includes personnel from CNR EURAFSWA, NAVINGEN, WQOC, NAVFAC HQ, CNIC, BUMED, NAVFAC EURAFSWA, NMCPHC and installations, plus all the subsets of these organizations.”

Source: Commander, Navy Region Europe, Africa and Southwest Asia (CNR EURAFSWA) Employee, 26 September 2012

The management-by-committee framework is overburdened with both oversight and management roles and the end result is that neither role is accomplished effectively. Generating oversight policy through the water quality board system is a very slow process. For example, CNIC did not issue an overseas drinking water instruction until 2013, four years after the SECNAV imperative. The water quality board system has struggled with determining what the oversight policies are (or will be), whether they apply to overseas installations and how they will be implemented. In essence, the management of the water systems is on a part-time basis considering the amount of time that owners/operators spend deciding what the rules are, when they apply and how they should be implemented. Furthermore, any level of the water quality board (or region commanders/ICOs) can disregard the direction of other water quality boards or third-party oversight, which occurs often due to the conflicts of interest and differing priorities in



this self-regulating framework. The current management-by-committee framework functions more as an advisory framework regarding oversight and management rather than as a framework with any regulatory authority or one that demands compliance with managerial initiatives and decisions.

When the water quality board system does focus on management issues, this focus is on headquarters level and “big program” policies. The water quality boards meet on a part-time basis and do not get into the detailed, rigorous discussion of plant operations that is necessary to correct long-standing deficiencies and meet SECNAV’s 2009 imperative. There is not an efficient process for the water quality boards that focuses on management and operations at the water system level to identify trends and deficiencies across multiple water systems, which then drives policy and procedure implementation for the entire program. The policies and procedures that are generated at the headquarters level (WQOC) often have very little impact that translates to better management and operations at the water system level as measured by an increase in compliance with U.S. standards and FGS. Reviewing Figure 1-5, NAVINGEN believes that the overseas water program requires more headquarters management and resources by CNIC, NAVFAC and BUMED that directly impacts the management and operations of water systems. The current management framework lacks a rigorously detailed management approach that is necessary to meet SECNAV’s 2009 imperative. Because compliance with SECNAV’s 2009 imperative requires a primacy agency in our opinion, a reorganization of managerial structure and function will enable owners/operators of water systems to provide appropriate managerial actions in response to a primacy agency that provides the oversight and enforcement authority directly at the installation level to ensure that the protection of public health is the priority for the overseas drinking water program.

### **Recommendation:**

- 2-1. CNO direct BUMED, CNIC and NAVFAC to develop and implement a management framework with resources focused on managing water operations to ensure installation commanding officers comply with SECNAV’s 2009 imperative, FGS and Navy regulations. The initial plan will be forwarded to the SECNAV Primacy Agency Office for approval and the management of overseas drinking water will receive continuous oversight and enforcement authority from the Primacy Agency Office.



## 2.2 Examples of Inadequate Overseas Drinking Water Program Management

This chapter, much like Chapter 1, presents deficiencies of the current managerial framework and concludes that a different managerial framework (Figure 1-5) must be implemented to meet SECNAV's 2009 imperative. The shortcut approach that involves adopting only MCLs from the SDWA and selective primacy components interspersed with management functions is incapable of ensuring Navy personnel receive drinking water that meets U.S. standards. U.S. standards take the entire SDWA into account, not just MCLs and select primacy components. In this next section, we will discuss specific drinking water management topics (with some oversight because the current managerial framework mixes the two functions) that will clearly demonstrate the current management framework lacks the capability to meet SECNAV's 2009 imperative. These topics provide examples of documented managerial deficiencies in the Navy's overseas water program. These examples are not exhaustive, since each is multifaceted and has layers of deficiencies that apply to many different contexts depending on the perspective. For the purpose of this special study, they illustrate management practices that ultimately deliver drinking water to a lower standard at overseas installations compared to Navy installations in the United States.

### Recent One-Day Assessments Conducted by CNIC

Between November 2012 and March 2013, CNIC conducted One-Day Assessments of each Navy overseas drinking water system. These One-Day Assessments were designed to provide a snapshot of overseas installation's water system compliance based on three criteria: potability of the water, compliance with U.S. standards and compliance with FGS. This snapshot information was captured as dashboards for each overseas water system; Figure 2-3 is the Commander Fleet Activities (CFA) Sasebo dashboard. One-Day Assessments documented that not a single overseas water system is in compliance with U.S. standards and many are not in compliance with FGS. Yet, according to CNIC metrics displayed in the dashboards for all the water systems, almost all water systems are considered compliant for delivering potable water.

The SDWA requires water system owners/operators to track, assesses and consistently maintain drinking water quality and compliance with U.S. standards over time. One-Day Assessments were an attempt by CNIC to determine both potability and compliance with applicable U.S. drinking water standards. Unfortunately, a One-Day Assessment provides only a snapshot in time, and is insufficient to verify the range and scope of compliance deficiencies, water quality issues and standards included in the SDWA. Despite the obvious drawbacks and shortfalls of One-Day Assessments, CNIC has apparently used them to tout the potability of drinking water in

demonstrably noncompliant systems (see Figure 2-3). Additionally, One-Day Assessments are not conducted by primacy agencies in the United States (including Navy installations) for the purpose of measuring compliance; sanitary surveys are utilized by primacy agencies to determine compliance and to implement corrective actions for identified deficiencies.

Installation	Site	Population Served (max.)	Supply Source	Water Treatment on Site	Potable	Comments on Potability	Current JEGS /OEBGD Compliance	Comments on Current JEGS Compliance Status	US STANDARD COMPLIANCE (including CTO)	Comments on US Standards
CFAS	Main Base	3,500	Sasebo City	None	Yes	None	No	Not in compliance with: 1-13 (See legend)	NO	CTO procedures being finalized with WQOC.
CFAS	Akasaki	100	Sasebo City	None	Yes	None	No	Not in compliance with: 1-3, 5, & 7-12	NO	CTO procedures being finalized with WQOC.
CFAS	Iorizaki	20	Sasebo City	None	Yes	None	No	Not in compliance with: 1-3, 5, & 7-12	NO	CTO procedures being finalized with WQOC.
CFAS	Yokose	200	Saikai City	None	Yes	None	No	Not in compliance with: 1-3 & 5-13	NO	CTO procedures being finalized with WQOC.
CFAS	Hario Housing	2,000	Sasebo City	None	Yes	None	No	Not in compliance with: 1-3, 5-13	NO	CTO procedures being finalized with WQOC.
CFAS	Maebata	100	Sasebo City	None	Yes	None	No	Not in compliance with: 1-3, 5, 7-13	NO	CTO procedures being finalized with WQOC.
CFAS	Hario-Shima	100	Sasebo City	None	No	ENV declared this water system as non-potable due to no current capabilities to monitor turbidity	N/A	Not in compliance with: 1, 2, 6, 8, 9, 11 & 12	NO	CTO procedures being finalized with WQOC.

**Legend for column I (FGS compliance status)**

1. Total Coliform sampling
2. Free available chlorine residual
3. Lead and Copper monitoring
4. Pesticide and PCB monitoring
5. Disinfectant/Disinfection Byproducts (DBPR) monitoring
6. Turbidity monitoring
7. Effective Cross Connection Program
8. Potable Water Master Plan
9. Potable Water Emergency Contingency Plan
10. Effective Annual Water Main Flushing
11. Notification Requirements and Consumer Confidence Report (CCR)
12. Water Operator and Certification
13. Operation and Maintenance requirements (Air Gap, Screen, Seal, Housekeeping, etc.)

Figure 2-3. Drinking water dashboard cites multiple violations of the FGS, yet water is considered “potable” as indicated by the green color code. Source: One-Day Water Quality Assessment, CFA Sasebo, 23 January 2013

NAVINSGEN believes that using One-Day Assessments as a means to certify potability has created a very high risk for the Navy. In the SECNAV 2009 imperative, which states that Navy personnel will receive drinking water that meets U.S. standards, there is no disclaimer that only select requirements from the SDWA will be used to determine U.S. standards. The current management framework for overseas drinking water arbitrarily decided to assess compliance at a lower standard than how compliance is assessed in the United States. In addition, although the business rules of the One-Day Assessments may be faulty and will be discussed next, these One-Day Assessments have identified an additional list of deficiencies that would require immediate corrective action if found at Navy installations in the United States. The text box

#### Congressional Investigation of Camp Lejeune Water Contamination

“We want to know what did [the Navy and Marine Corps] know about the water, when did they know, and what did they do about it?”

Source: Congressman Brad Miller (D-NC), Chairman of the United States House Committee on Science & Technology’s Subcommittee on Investigations & Oversight, 3 March 2010

references the deficiencies at Camp Lejeune and asks “what did the Navy know, when did they know it and what did they do about it.”

This level of scrutiny could be applied to the manner in which One-Day Assessments were conducted and whether the deficiencies were corrected in a manner that is congruent with SECNAV’s 2009 imperative. NAVINGEN believes there is an expectation in the SECNAV 2009 imperative that deficiencies at Navy overseas installations must be corrected in the same manner that deficiencies are corrected at Navy installations in the United States.

In Chapter 1, we discussed the flooded vault deficiency and how it was processed differently in the United States versus at a Navy overseas installation. That example was followed by a discussion of the management framework indicating deficiencies as corrected through their self-regulating process, yet external third-party inspections found that the deficiencies were still not adequately corrected. As stated previously, NAVINGEN believes not processing these deficiencies in a manner consistent with U.S. standards puts the Navy at very high risk for criticism that it does not ensure the protection of public health for our Navy personnel. NAVINGEN has identified multiple deficiencies listed in One-Day Assessments that require public notification, some level of protection for Navy personnel and a plan for immediate corrective action.

The business rules applied to the One-Day Assessments make the categories for the levels of compliance arbitrary. Dashboard criteria for rating compliance with FGS and U.S. standards are based on a 90 percent “rule of thumb”<sup>23</sup> which is contrary to methods used by primacy agencies in the United States. Installations that meet 90 percent of the checklist criteria included in the assessment are rated “green” and considered to be in compliance. This rating criteria does not account for the severity or risk to public health of any of the compliance deficiencies. For example, the EPA requires that sanitary surveys list deficiencies based on severity, from minor administrative deficiencies to significant violations. EPA guidance states that significant deficiencies “...have the potential to cause the introduction of contamination into water...”<sup>24</sup> and therefore require immediate corrective action.

To illustrate this issue, NRTF Niscemi’s One-Day Assessment received a “green” rating for compliance with FGS. However, NRTF Niscemi has multiple violations meeting the “significant” criteria identified in sanitary surveys including cross-connections in the piping system, bromate exceedances and failure to maintain adequate disinfection. All significant

<sup>23</sup>CNIC brief, March 2013

<sup>24</sup>EPA guidance manual, 4-3, April 1999

deficiencies require immediate corrective action. Rating NRTF Niscemi as “green” does not accurately reflect the compliance status and the level of health risk posed to Navy personnel. In circumstances like these, Navy personnel receive a lesser quality of water than in the United States, which creates dichotomous health risks for Navy personnel depending on where they are stationed. Any installation with uncorrected significant deficiencies in a sanitary survey should not be captured in a One-Day Assessment as “green,” for compliance.

Furthermore, NAVINGEN found inconsistent results when comparing installation compliance status determined by One-Day Assessments. For example, Naval Support Facility (NSF) Diego Garcia ratings are not consistent with ratings for Port of Jebel Ali, United Arab Emirates. The three active NSF Diego Garcia water systems are rated “green” for Overseas Environmental Baseline Guidance Document (OEBGD) compliance (Note: FGS does not apply since there is no host nation). The fourth system is a planned nano-filtration plant (FY13 MILCON), yet it is listed as complying with the OEBGD and providing drinking water. The “green” ratings obscure the fact that NSF Diego Garcia does not have potable water at the tap. Instead, Sailors use bottled water or fill water bottles from centrally located water tanks. In contrast, Navy personnel at the Port of Jebel Ali are required to use bottled water and compliance with FGS is listed as “red.”

The compliance ratings assigned are arbitrary, unreliable and do not accurately reflect the compliance of these water systems in regards to U.S. standards, FGS or whether the water systems deliver potable water. Given the unorthodox methodology of these One-Day Assessments, their findings should not be allowed to supersede the findings of sanitary surveys and third-party inspections and should only be utilized as a record of known deficiencies with no validity towards gauging compliance with U.S. standards, FGS or whether the water systems actually deliver potable water.

### **How is the water not compliant with U.S. standards and FGS but still considered potable?**

Under the current management framework, as indicated in Figure 2-3, water can be “rated” as noncompliant with U.S. standards and FGS, yet the water is still “rated” as potable. This is the prevalent state for overseas water systems and is incompatible with management practices necessary to meet SECNAV’s 2009 imperative. The data indicates that owners/operators of Navy overseas water systems are arbitrarily defining potable water based on ad-hoc “health risk assessment” processes and by interpreting the definition of potable water and other definitions related to the consumption of water for domestic uses. Navy water systems in the United States

are regulated by primacy agencies and are not able to engage in either of these internal management practices to certify their water as “potable” when the systems are out of compliance with U.S. standards.

NAVINSGEN believes it is fundamentally unethical to disregard U.S. standards and FGS violations while continuing to deliver water for human consumption. The following scenario will serve to illustrate this point. The water system owner/operator presents data indicating the water is non-potable (e.g., MCL exceedance not in compliance with U.S. standards and FGS) to local preventive medicine personnel. Local preventive medicine personnel proceed to conduct an ad-hoc “health risk assessment” either in a formal or informal manner, characterizing the hazard of the non-potable water as only a “chronic” hazard but not an “acute” hazard, therefore declaring the water “potable.” An “Acute” hazard is defined as the presentation of clinical disease or death. The water system owner/operator considers this characterization as justification to circumvent U.S. standards and FGS, and concludes no violation occurred, no public notification is required and no corrective action plan must be implemented. The MCL exceedance is allowed to continue and Navy personnel do not know the true quality of the water. This is one variation of a “health risk assessment” and other variations include the owners/operators knowing their water system is out of compliance and internally deciding (often informally) that no action needs to be taken, including not notifying preventive medicine personnel.

“Health risk assessments” used to circumvent established MCLs (or declare water “potable” when it does not comply with U.S standards and FGS) does not occur in the United States under the primacy model. In fact, the text box on the right is a brief quote from Appendix B, which outlines the EPA’s approach to chronic MCL exceedances and other situations that require public notification. Additionally, there is no authorization for local preventive medicine personnel to conduct “health risk assessments” for characterizing the acute or chronic hazard of a contaminant and then using this characterization as justification to supersede MCLs and Navy regulations. To continue this “health risk assessment” practice allows for dichotomous health risks to exist depending on whether Navy personnel are stationed in the United States or overseas. Adverse health outcomes related to chronic noncompliance (or in compliance but delivered at a lesser public health standard than in the United States) are significant risks to the

“Customers should be aware that chronic contaminant levels exceeding the MCL could cause cancer, liver or kidney problems, reproductive difficulties, or other health effects.”

Source: “Talking to Your Customers About Chronic Contaminants in Drinking Water, a Best Practices Guide,” EPA 816-F-07-022, October 2007 (See Appendix B)

Navy and may result in scrutiny from others (e.g., media, public opinion, Department of Veterans Affairs [VA] and Congress) if this practice is allowed to continue. The manner in which some of these “health risk assessments” are conducted could be considered a knowing and willful violation of FGS, Navy regulations and U.S. standards.

Although there are no precise or universally accepted definitions for the terms **potable** and **non-potable** water, they are defined in various regulations and instructions that govern drinking water at Navy overseas installations. Owners/operators of many overseas water systems, who continue to deliver water for human consumption despite chronic deficiencies, have frequently rationalized this questionable practice by arbitrarily redefining or reinterpreting MCLs, regulations or potable water definitions to suit their particular circumstances. Prior to the One-Day Assessments, owners/operators routinely questioned the criteria for defining potable and non-potable water. This quote from a CNIC employee email captures the essence of the debate:

*“We have debated that definition of potable and non-potable for a long time. The local PMA [preventive medicine authority] has determined that the water is safe for bathing and showering, but this is one of the issues we have continuously experienced where there is varying opinion in the field and also how we define water that is safe for drinking. If there is no acute public health risk, but the water is not meeting [maximum contaminant limits] MCLs for a constituent, can we say the water is not safe for drinking but fit for bathing and showering? Or do we lump the package and say it is non-potable and should not be used at all because it does not meet all the criteria for human consumption?”*

In the United States, where the SDWA is the accepted standard and enforceable by law, Navy installations cannot willfully disregard compliance violations through the selective interpretation of definitions (e.g., potable water), regulations and standards or use of “health risk assessments” to justify declaring water “potable” (or declaring for what purposes non-potable water can be used). Based on our understanding of U.S. water quality standards, and the FGS, NAVINSGEN believes those standards must be met for water to be considered potable, and that only primacy agencies can establish criteria required for human consumption (e.g., all domestic uses) of drinking water.

Collectively in some cases, “health risk assessments” and redefining/reinterpreting definitions are both used at Navy overseas installations to allow drinking water that has been declared “non-potable” to be delivered to Navy personnel for human consumption. For example, water at the Navy facility in Jebel Ali, United Arab Emirates is non-potable, yet U.S. Central Command preventive medicine personnel have authorized its use for washing, cleaning and showering since



2010. This practice is a violation of Navy regulations that explicitly state, “*The use of non-potable water for bathing and laundering of clothes is prohibited for Navy and Marine Corps installations and vessels.*”<sup>25</sup> In addition to Navy regulations, the SDWA does not allow water that is noncompliant with U.S. standards to be used for human consumption on a routine basis.

## Recommendations:

In our opinion, these deficiencies along with the other deficiencies documented in this special study cannot be corrected within the current managerial framework. The implementation of a primacy agency that administers direct oversight and enforcement authority at the installation level, along with a management framework that focuses on detailed water operations management at the installation level, will correct these deficiencies. Although the following recommendations require oversight from the primacy office when established, these recommendations address high risk deficiencies and require immediate attention.

- 2-2. CNO direct CNIC to take immediate action (e.g., public notification, additional monitoring, implementation of correction actions) for significant deficiencies identified during the One-Day Assessment process.
- 2-3. CNO direct CNIC, NAVFAC and BUMED to cease reinterpreting and redefining existing standards and definitions related to drinking water. Comply with existing instructions and standards that define potable water and acceptable uses for non-potable water; the primacy agency office will ultimately define definitions and standards criteria.
- 2-4. CNO direct BUMED to discontinue “health risk assessments” conducted by local preventive medicine personnel that circumvent U.S. standards, FGS and Navy regulations. Any health risk assessments (in rare and defined instances) should only occur with the full visibility of BUMED leadership and be conducted by a multidisciplinary team from NMCPHC.

## One-Day Assessments do not capture long-standing significant compliance deficiencies

Insufficient disinfection of NAS Sigonella drinking water has been repeatedly cited in multiple sanitary surveys and NAVINGEN reports since 2001. Despite the repeat findings, these specific deficiencies were not captured as part of the One-Day Assessment dashboards, and no action was assigned for correcting these deficiencies. This long-standing deficiency will be discussed in this section from a management perspective and further in Chapter 3 from an operations perspective.

<sup>25</sup>BUMED P-5010-5, Chapter 5, Water Supply Ashore, Section 5-19.d, 23 June 2008



In response to an anonymous complaint, NAVINGEN visited NAS Sigonella 21-22 November 2011. A review of NAS Sigonella's water production facility records indicated non-potable water was distributed to base personnel in early October 2011. In the 2 December 2011 report to CNIC, NAVFAC and NAS Sigonella, NAVINGEN stated, "...non-potable water was distributed to the NAS base population..." during a period of 1 to 4 days in early October 2011. The NAVINGEN report identified additional concerns and concluded, "The long-standing history of compliance issues at NAS Sigonella diminishes confidence that the drinking water system consistently meets environmental and public health standards."<sup>26</sup>

In a letter dated 6 April 2012 (Figure 2-4), the region commander not only ignored the water quality concerns, but completely mischaracterized the NAVINGEN

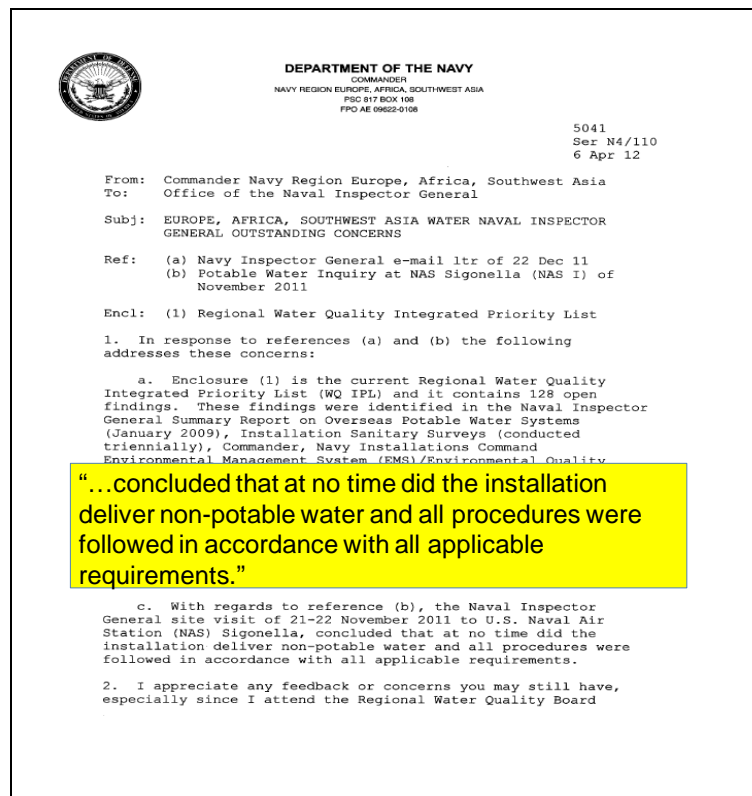


Figure 2-4. Regional commander states all procedures met U.S. standards and FGS. Source: Commander Navy Region EURAFSWA letter, 6 April 2012

report conclusions. Despite clear evidence to the contrary presented in the NAVINGEN report, as well as NAS Sigonella's own records documenting that there was insufficient chlorination in the water distribution system during this time period, the region commander stated, "...the Naval Inspector General site visit ...concluded that at no time did the installation deliver non-potable water and all procedures were followed in accordance with applicable requirements."

During the Europe Area Visit in September 2012, NAVINGEN found NAS Sigonella failed to properly disinfect water from October 2011 through September 2012 (presented as an operations deficiency in Chapter 3). In the 21 September outbrief, the NAVINGEN team noted multiple drinking water deficiencies and the Naval Inspector General personally expressed his concerns with the long-standing violations at NAS Sigonella.

<sup>26</sup> NAVINGEN Director for Installations, Environment, Safety and Occupational Health (N7) email to CNIC, NAVFAC and NAS Sigonella, NAVIG Sig Water Trip Report, 2 December 2011

In response, a CNR EURAFSWA staff member stated that the "water today is potable." However, all chlorine residuals recorded in NAS Sigonella's log book for that day were below the required disinfectant level and half of the pH readings were out of compliance (see text box). This clearly indicates water entering the distribution system was not properly disinfected, and therefore was not potable.

#### **Chlorine and pH Deficiencies on 21 September 2012**

Data from water treatment plant log sheet for water at the point of entry to the distribution system:

- Chlorine readings (in mg/L) were 1.14, 1.15, 1.00, 1.09 and 1.05. The required level is 2.0 mg/L.
- pH readings range from 5.27 to 10.6. FGS requires pH between 6.5 - 9.5.

Source: NAS Sigonella NAS I log sheet, 21 September 2012

In the United States, if free chlorine residuals drop below the required level, the Navy water system is required to, at a minimum, immediately notify the primacy agency, notify Navy personnel (through a formal public notice) and initiate corrective action to ensure proper disinfection. Despite documented deficiencies in multiple sanitary surveys, inspection reports and the additional SECNAV imperative to meet U.S. standards, NAS Sigonella still has not initiated effective corrective action. Depending on regulatory scrutiny and perspective, the managerial perspective on this long-standing deficiency could be considered knowing and willful violation of U.S. standards and FGS, and indifferent to public health compliance.

#### **NAS Sigonella blends untreated well water with treated water despite public health concerns raised by WQOC, BUMED, CNIC and NAVFAC**

The following is yet another example of institutional indifference to public health as the priority for the Navy's overseas drinking water program. NAS Sigonella (with NAVFAC EURAFSWA support) continues to blend untreated well water with treated water despite documented concerns for public health (Figure 2-5). This situation, which was not adequately characterized in One-Day Assessments, has ultimately been allowed to continue because of the ineffective management-by-committee framework and the lack of a primacy agency with oversight and enforcement authority to ensure public health remains the priority. Since untreated well water could contain bacteria, viruses and/or unknown chemical contaminants at any given time, blending could be harmful to Navy personnel.

In accordance with the FGS, blending is not permitted when the source of the untreated water is "groundwater under the direct influence of surface water" (GWUDISW). Based on an engineering evaluation of multiple sanitary surveys and studies, the WQOC, BUMED, CNIC and NAVFAC concluded that the installation should assume that the well water source is under the direct influence of surface water (and, therefore, potentially contaminated), and that NAS

Sigonella should not blend the untreated well water with treated water (Figure 2-5).

Unfortunately, NAS Sigonella disregarded the engineering evaluation and advice from the WQOC, BUMED, CNIC and NAVFAC and continues to blend untreated water with treated water.

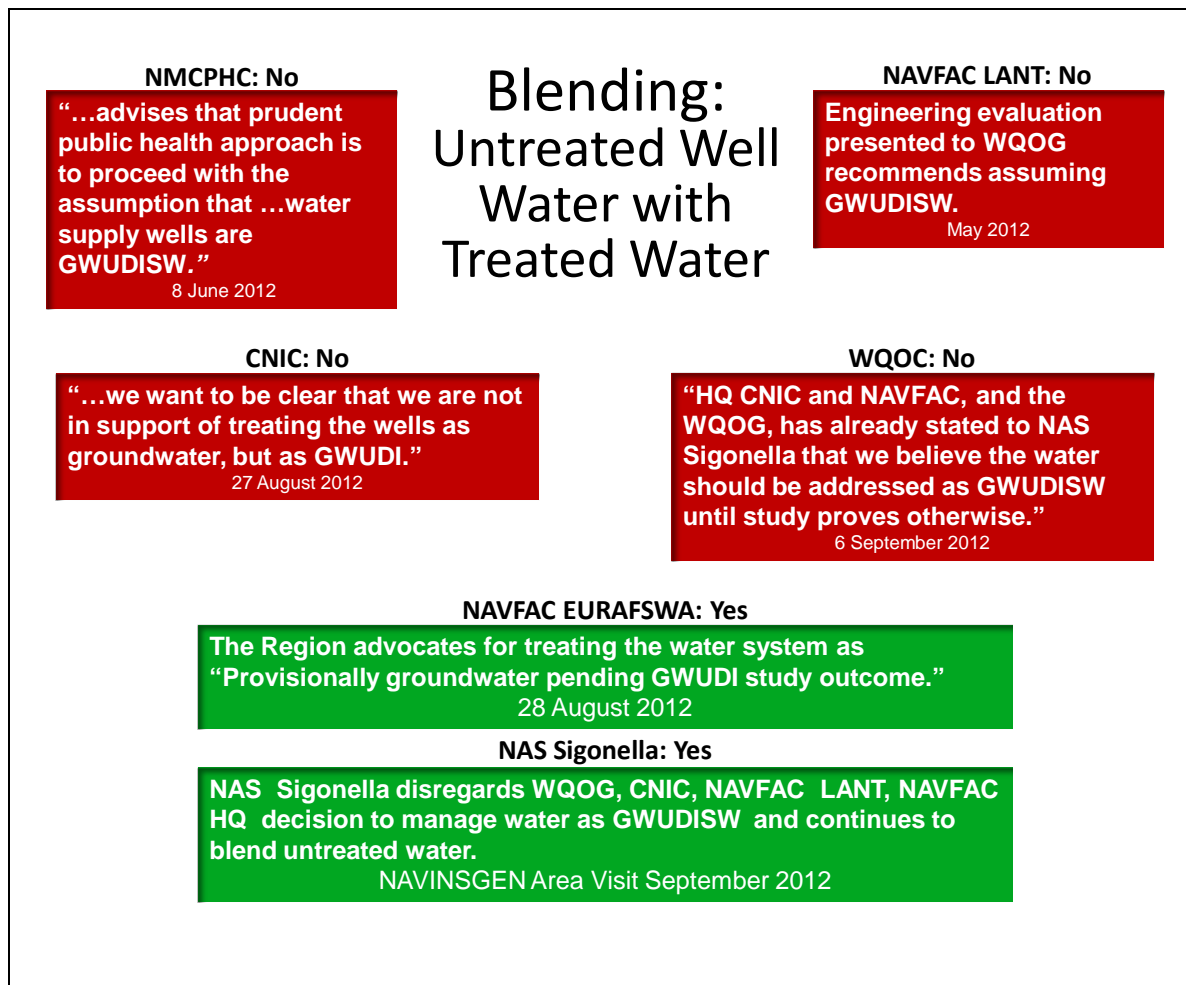


Figure 2-5. NAS Sigonella blends untreated well water contrary to BUMED/NMCPHC, NAVFAC LANT, CNIC and WQOC direction. GWUDISW is groundwater under the direct influence of surface water. Source: NAVINGEN, July 2013

Although past studies indicate the water is potentially GWUDISW, current studies are underway to confirm the earlier findings. Until such time as those studies verify the actual classification of the groundwater, NAS Sigonella should assume the water is GWUDISW and implement the appropriate compliance criteria and refrain from blending water until after the studies conclude that the water is or is not GWUDISW. While this is the correct and most prudent procedure to protect public health, NAS Sigonella has failed to implement the specific compliance criteria. This example illustrates how the current management-by-committee framework routinely disregards higher authority direction, increases the health risk of Navy personnel through unacceptable management decisions, and ignores SECNAV's 2009 imperative since under these circumstances this management practice is prohibited in the United States.

## Recommendation:

- 2-5. CNIC direct NAS Sigonella cease blending untreated groundwater until clear evidence documents the groundwater is not under the direct influence of surface water.

### Managing a Chronic Bromate Exceedance at NAS Sigonella

This final, multi-faceted example identifies numerous deficiencies that are a direct result of the current managerial framework and the lack of a primacy agency with oversight and enforcement authority. The management-by-committee water quality board system lacks a process to ensure installations report and correct noncompliance with U.S.

standards and FGS, including MCL violations.

NAS Sigonella first became aware of bromate MCL exceedances in December 2011. While NAVFAC EURAFSWA staff acknowledged the public notification clock started on 27 December 2011, when the first laboratory report was signed, reporting the exceedance was delayed for 140 days. When the public notice was finally posted on NAS Sigonella's facebook page on 28 May 2012, it incorrectly stated the violation awareness date as 17 May 2012, and omitted any mention of the

December 2011 and March 2012 high bromate test results. Furthermore, it inaccurately advised that, "Showering, hand washing, tooth brushing, and dish washing will not lead to any significant exposure to bromate."<sup>27</sup> Timely public notification is an integral part of the SDWA and FGS requirements (see text box) necessary to protect public health. The purpose of a public notice is to immediately alert Navy personnel of any serious problems with their drinking water so they can take appropriate protective measures (also see Appendix B, "Talking to Your Customers about Chronic Contaminants in Drinking Water").

As previously stated in Chapter 1, compliance with MCL standards is a cornerstone of the SDWA and contributes to the delivery of potable water. NAS Sigonella conducts routine sampling for contaminants, as required by the FGS. Samples collected in December 2011, March 2012 and May 2012 documented bromate levels above the MCL (Figure 2-6).

Immediately upon receipt of the December 2011 sample test results that exceeded the bromate

**FGS Requirement...**"C3.2.2.3 If a system is out of compliance, the installation will complete the notification in C3.3 **as soon as possible.**"

Source: FGS, Italy, page 3-10, July 2008

**EPA Requirement**"...notices must be issued as soon as practical but **within 30 days** after a violation is discovered. For any unresolved violation, following an initial Tier 2 notice, you must **repeat the notice every three months** for as long as the violation persists."

Source: EPA Revised Public Notification Handbook, 2nd Revision of Document: EPA 816-R-09-013, page 59, March 2010

<sup>27</sup>Facebook post, NAS Sigonella web page, <http://www.facebook.com/nassigonella/posts/10151006328433336>, 28 May 2012

MCL, NAS Sigonella public works and preventive medicine personnel should have informed the appropriate water quality boards, and initiated action to eliminate the bromate contamination.

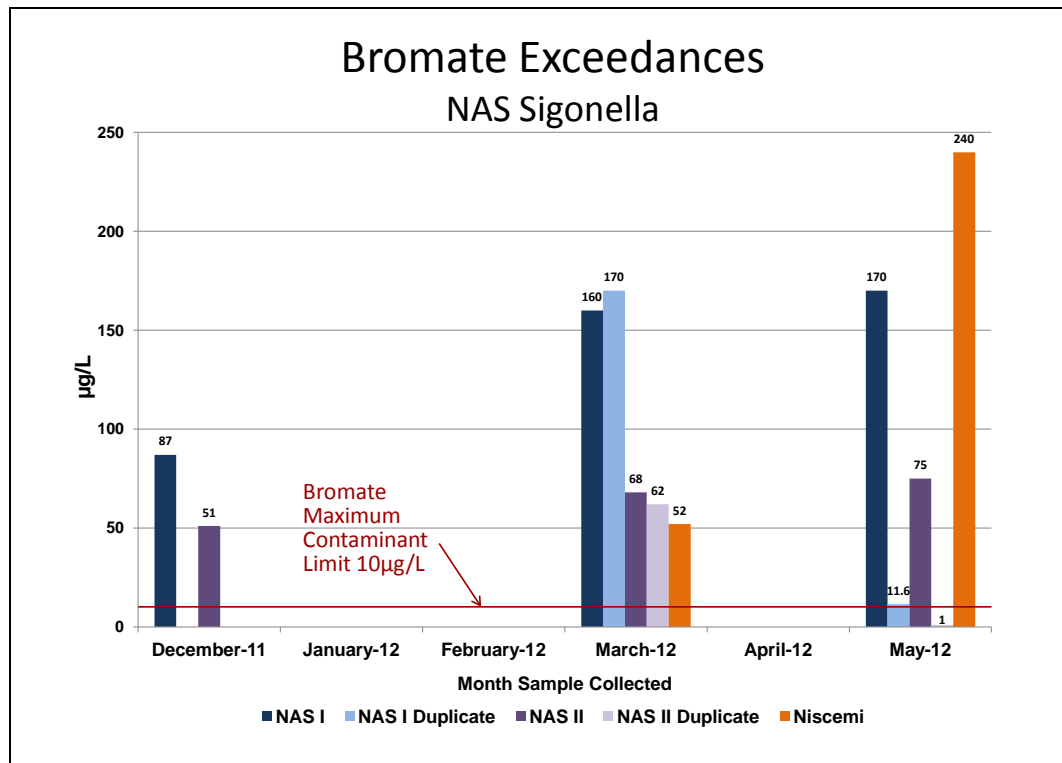


Figure 2-6. Eleven test results exceeded the 10µg/L bromate MCL, with one result 24 times greater than the MCL.

Source: NAVINSGEN, July 2013

However, rather than making the required notifications and taking necessary corrective action, they questioned the accuracy of laboratory results. Additionally, and again in violation of U.S. standards and FGS, local preventive medicine personnel conducted a “health risk assessment” and arbitrarily concluded that the elevated bromate concentrations in the drinking water did not pose an acute health hazard. Contrary to guidance in Appendix B and the SECNAV’s 2009 imperative, no public notification was made. In May 2012, with bromate test results up to 24 times the MCL, NAS Sigonella Public Works personnel informed the region (CNR EURAFSWA) of the bromate exceedances, but decided again to delay public notification until another round of water samples was collected and analyzed. This decision was reversed by the Principal Deputy, Assistant Secretary of the Navy for Energy, Installations and Environment (PDASN (EI&E)) who, upon learning of the bromate MCL exceedance, directed NAS Sigonella to immediately issue public notification. Many of the members of the WQOC, which is the highest echelon level of water quality boards, were unaware of the previous and ongoing MCL exceedances until May 2012.

In our opinion, this is just another example of the shortfalls inherent within a management-by-committee managerial framework that does not ensure the protection of public health is the

priority of the Navy's overseas drinking water programs. It was these types of public health issues occurring in drinking water systems across the United States that led to the enactment and implementation of the SDWA.

### **Noncompliant Laboratory Certification**

Instead of taking immediate action to identify the potential source of the bromate contamination, NAS Sigonella staff disputed the laboratory analysis test results. Over a six-month period, quarterly samples were sent to seven laboratories in three countries as NAS Sigonella staff continued to question the validity and credibility of laboratories, chemists and analytical test methods. Rather than questioning the validity and credibility of the analytical methods and personnel qualifications, NAS Sigonella should have specified the correct analytical method and assured samples were analyzed by an accredited laboratory and chemist.

NAS Sigonella failed to implement an appropriate laboratory quality assurance program to ensure laboratories and chemists were accredited and certified. Discrediting a laboratory, chemist or analytical test not only affects the bromate issue, but also discredits the validity of all water testing results that occurred during the entire time samples were analyzed by these laboratories. As a result, NAS Sigonella cannot verify that the water systems provided potable water during the period that water was tested with “incorrect test methods” or analyzed by “unaccredited laboratories.” This concept holds true for every overseas water system where sampling or analytical methods are faulty or not established for some of our overseas water systems as indicated by One-Day Assessments. The Navy is at high risk when the potability of water from its overseas water systems cannot be verified.

### **Recommendation:**

- 2-6. CNO direct CNIC and NAVFAC to follow laboratory quality assurance processes outlined in Chapter 29 of OPNAVINST 5090.1C for Navy overseas drinking water systems.



### **The Current State of Bromate Exceedance at NAS Sigonella**

The management-by-committee framework has failed to ensure compliance with U.S. standards and FGS and the high levels of bromate remain an uncorrected public health violation extending through 2013 with continued bromate exceedances. NAS Sigonella has not conclusively identified the source of the bromate or modified processes and procedures to ensure compliance with the bromate MCL. Samples collected in September 2012 and March 2013 contained bromate levels above the MCL at NAS I and NRTF Niscemi. Although the test results are lower than the May 2012 test results, the test results indicate there is still bromate contamination. Navy personnel continue to use the water for human consumption without the benefit of proper notification and characterization of the health risks that are consistent with SECNAV's 2009 imperative.

### **Recommendations:**

- 2-7. CNO direct CNIC and NAVFAC to follow all regulations and standards regarding public notification; develop and implement a standard process for public notifications using the EPA Public Notification Rule and Public Notification Handbook.
- 2-8. CNO direct ICOs to immediately notify the appropriate chain of command for all MCL exceedances and instances of noncompliance. Once established, the Primacy Agency Office will also be notified.

## Chapter 3: Drinking Water System Operations

### 3.0 Introduction

Chapter 2 discussed insufficient chlorine and pH parameters identified during the NAVINGEN site visit to NAS Sigonella on 21-22 November 2011. This discussion was from a managerial perspective of One-Day Assessments and the region commander not acknowledging that these ongoing operational deficiencies are significant. The trip report<sup>28</sup> from that site visit also discussed the following operational deficiencies:

- Treatment plant operators, watch personnel (Seabees) and supervisors lacked sufficient training to identify and correct water treatment plant deficiencies.
- Information entered on operational log sheets should have alerted operators of the deficiency before the non-potable water was distributed to Navy personnel.
- Training provided by NAVFAC EURAFSWA in October 2011 for water testing was not effective. Although the training reviewed standard procedures, deficiencies in the water testing program were still prevalent during the site visit on 21 November 2011.
- In October 2011, NAS Sigonella public works environmental division did not implement the standard operating procedure for public notification when water was known to be out of compliance by water plant personnel.
- A review of operational records and reports reveal numerous instances (over a 10-year period) of water treatment deficiencies that were not corrected. These deficiencies violate NAVMED P-5010-5, OPNAVINST 5090.1C, U.S. standards and FGS.

As stated in previous chapters of this special study, operational deficiencies remain uncorrected because there is no primacy agency to ensure these deficiencies are corrected and the current management framework does not focus on detailed management of water operations.

Furthermore, in our opinion, Navy water treatment plant operators do not consider the listed operational deficiencies, and other deficiencies, as “true” deficiencies that actually require corrective action. To be clear, we are discussing deficiencies identified in operational logs that would require immediate attention if the priority was protecting public health.

Chapter 3 focuses on two critical operational parameters (chlorine and pH); maintaining chlorine and pH levels within prescribed ranges are basic to the operation of every water treatment system. Water treatment operators universally understand the importance of routinely measuring, adjusting and documenting these parameters to ensure that treated water is continuously safe for human consumption. However, NAS Sigonella routinely violates the

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<sup>28</sup>NAVINGEN (N7) email, 2 December 2011

permissible operating ranges for chlorine and pH. The operational logs are more an exercise of merely filling out paperwork rather than driving real-time corrections to water system operations. A contributing factor to these water operation issues is the lack of a “professional-grade” skill set among the water operators; the chapter will conclude with this discussion.

### **3.1 Water Treatment Logs Document Operational and Management Deficiencies**

The required residual chlorine level at the point of entry (water entering the water distribution system) has been a point of contention for many years at NAS Sigonella. Sanitary surveys, conducted by independent third-party evaluators, have routinely recommended higher point of entry chlorine levels based upon specific evaluations of NAS Sigonella’s water systems. The general FGS guidance, which is not specific to NAS Sigonella’s water systems, sets lower chlorine residual levels than what is recommended in the sanitary surveys. Of note, the FGS does not take into account the specific characteristics of the NAS Sigonella water systems. The sanitary surveys do take into account these specific characteristics and offer recommendations that protect public health accordingly (e.g., higher chlorine levels to ensure adequate disinfection). The water treatment plant operators at NAS Sigonella consistently fail to maintain the chlorine residual levels listed in the sanitary surveys even though these recommendations are based upon a specific evaluation of NAS Sigonella water systems.

The 2009 sanitary survey determined that operators should increase the chlorine dose to 2.0 mg/L at the point of entry in order to ensure adequate disinfection throughout the distribution system. As shown in Figure 3-1, Sigonella and region management tracked this requirement on their POA&M and reported the action complete in August 2010. Figure 3-1 also includes a copy of an operational log from 21 August 2012 that shows the minimum chlorine concentration was never attained in any of five samples taken throughout the day. Although the requirement to chlorinate to 2.0 mg/L was acknowledged as complete in the POA&M, operators routinely chlorinated less than this concentration. Water treatment plant operators view the sanitary survey recommendation as “optional” or as an additional “safety factor” for proper disinfection. The sanitary surveys do not indicate that this is optional or an additional safety factor; the recommendations for higher chlorine levels are necessary to ensure adequate disinfection of the NAS Sigonella water distribution system.

The problems with the operational log on 21 August 2012 led NAVINSGEN to review NAS Sigonella’s compliance with recommended chlorine residual and pH levels for the prior year.

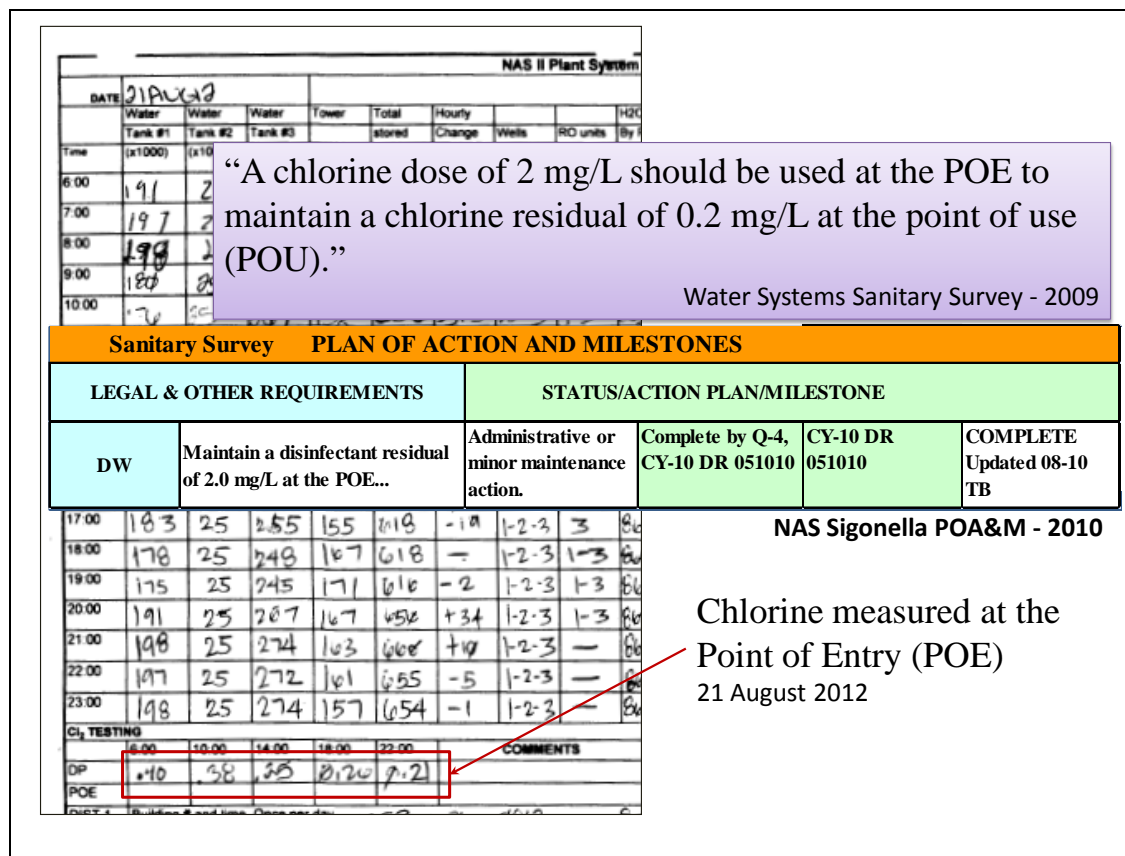


Figure 3-1. NAS II water treatment plant 21 August 2012 log sheet documenting insufficient disinfection at the point of entry.  
Source: NAVINSGEN, July 2013

When NAVINSGEN evaluated the operational logs for September 2011 to August 2012, we confirmed inadequate disinfection of the drinking water was a recurrent problem as documented in previous sanitary surveys. During the 12-month period, water entering the distribution system failed to meet the required chlorine residual levels on 95 percent of the days (Table 3-1). Operators and their supervisors regularly signed the log sheets without documenting the problem and neither local nor regional program managers provided oversight or initiated corrective action to address the issue. Reviewing the POA&M entry in Figure 3-1 that indicated this recommendation had been implemented, NAVINSGEN concludes that this POA&M entry was not correct, as this recommendation was not completed.

Location	Number of days the chlorine concentration failed to meet specifications at the point of entry	Noncompliance rate
NAS I	347	95%
NAS II	352	96%

Table 3-1. Inadequate chlorination during a one-year period. Noncompliance rate equals percent of days chlorine concentration failed to meet specifications. Source: NAS Sigonella operational logs, 1 September 2011 to 31 August 2012

This is not the only incident related to chlorine levels at NAS Sigonella as there is a history of wide swings in chlorine levels. This has been documented as early as the 2001 sanitary survey and confirmed by NAVINGEN during the site visit in November 2011. From an anonymous complaint, NAVINGEN substantiated the allegation that NAS Sigonella operated for a period of 1-4 days in October 2011 without any chlorine fed into the water system. No public notification or protective action was implemented for Navy personnel. During the site visit, the water was found to have very high levels of chlorine. In our evaluation, going from a period of time with no chlorine in October to having too much chlorine in November indicates a wide swing in chlorine levels and a chlorine parameter that is not within FGS or U.S. standards.

Wide swings in the pH of treated water have also been documented in sanitary surveys. Sigonella's chronic problems regulating pH were also evident in NAVINGEN's review of the logs. As shown in Figure 3-2, the pH levels at Sigonella routinely varied from high to low, often exceeding the acceptable range. The log sheets for September 2011 to August 2012 confirmed problems controlling pH during the treatment process remain unresolved. Table 3-2 summarizes the number of days that at least one pH reading was above or below the allowable range.

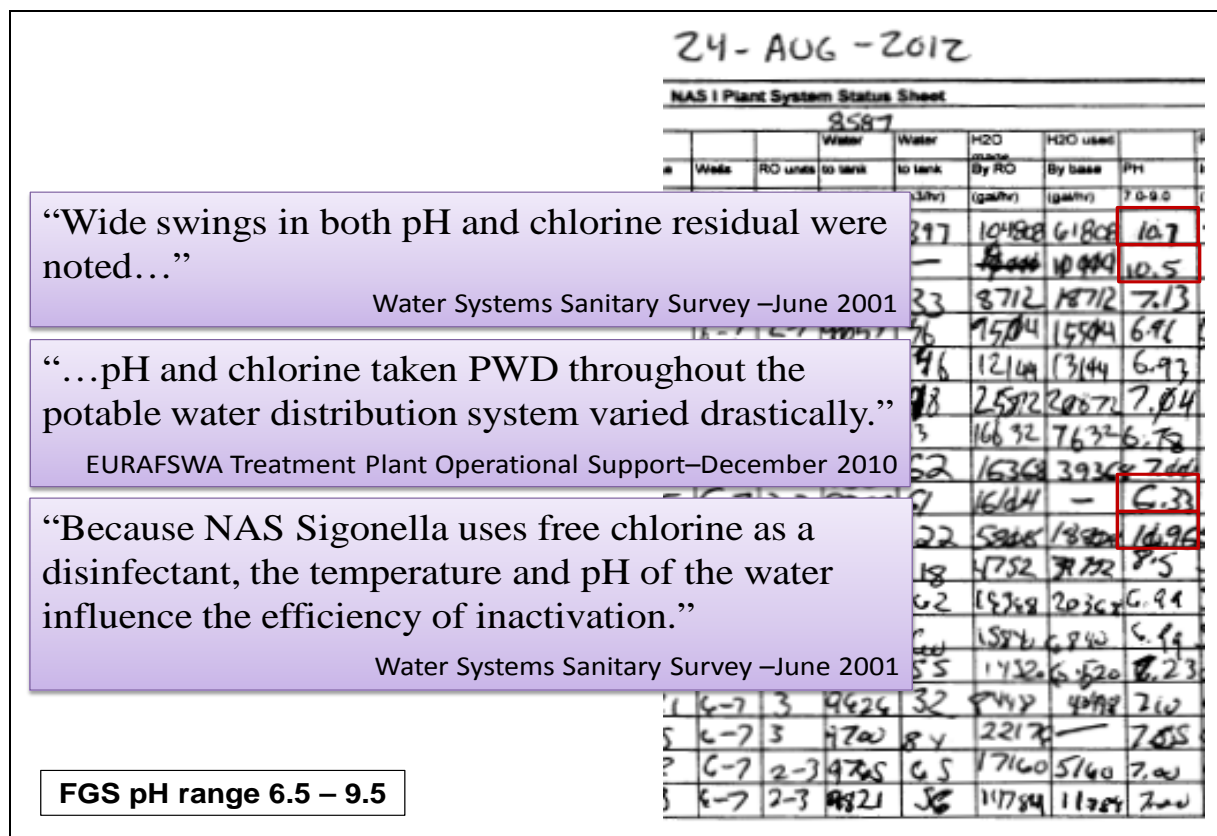


Figure 3-2. NAS I water treatment plant log sheet with excerpts showing deficiencies noted in previous reports. Source: NAVINGEN, July 2013

Location	Number of days the pH violated U.S. standards and FGS	Noncompliance rate
NAS I	119	32%
NAS II	39	11%

Table 3-2. pH readings that violated U.S. standards and FGS over a one-year period. Noncompliance rate equals the percent of days pH violated standards. Source: NAS Sigonella operational logs, 1 September 2011 to 31 August 2012

These pH swings can have immediate public health implications (e.g., corrosivity of drinking water) and indirectly can affect other water parameters such as chlorine. Basic water chemistry indicates a relationship exists between pH and chlorine, two parameters used in home pool testing kits (see Appendix C). The efficacy of chlorine is affected by maintaining pH within a certain range. From a more analytical perspective, there is a relationship between pH and metals that interact with water systems (e.g., metals leaching from pipes into the water). NAS Sigonella has a history of corrosion within their water distribution system and would benefit greatly from operating within a tight pH range to minimize corrosion.

In summary, despite repeated claims by installation and regional personnel that the “water is safe to drink” at NAS Sigonella, NAVINSGEN’s review of pH and chlorine test results during a one-year period indicated that the water met both pH and chlorine acceptable ranges only 7 days at NAS I and 11 days at NAS II. Based on the frequency of these occurrences it appears that operating out of compliance is a routine and accepted practice by the current management-by-committee framework. These violations would clearly not be acceptable if the treatment plants were operated in the United States, and would not be condoned overseas if a Navy primacy agency was assigned oversight responsibility (Figure 1-5).

In the United States, maintaining operational logs is a standard industry practice used to improve quality control, assess key performance indicators and document operational accountability. Operators are required to perform tasks at specified intervals, to note any unusual conditions, to implement corrective actions when required and to sign the log when the tasks are completed. Unlike onboard our U.S. Navy ships, for example, there is little evidence that suggests operational logs at NAS Sigonella are effectively used to drive real-time corrections to water system operations.



## Recommendations:

- 3-1. CNO direct CNIC and NAVFAC to establish a water operations program using water log data to drive real-time actions to maintain water within compliant operating ranges. Forward program details to the SECNAV Primacy Agency Office for evaluation and approval.
- 3-2. CNO direct CNIC to establish a repository and require all managers of overseas potable water systems to submit operational logs to the SECNAV Primacy Agency Office for continual evaluation to ensure compliance.

## 3.2 Limitations of the Navy's Training and Certification

In the United States, one of the most important elements in consistently providing safe drinking water is ensuring water plant managers and operators have the knowledge, ability, training and judgment to properly perform their daily duties. Although EPA published guidelines<sup>29</sup> for the certification of water treatment plant operators in the United States, the Navy's overseas water program has yet to implement these guidelines for Navy overseas water plant operators despite SECNAV's 2009 imperative to meet U.S. standards. EPA's operator certification guidelines were developed to ensure that operators are trained, certified "... and have the knowledge and understanding of the public health reasons for drinking water standards." and ensure "Consumers are confident that their water is safe to drink."<sup>30</sup> The deficiencies discussed in 3.1 demonstrate that the water treatment plant operators (and their supervisors) clearly do not understand the public health implications of operating outside accepted specifications.

The EPA guidelines establish minimum training standards and give U.S. primacy agencies a framework for waterworks operator certification. Primacy agencies must develop specific operator certification programs that include essential elements such as requiring only certified operators make process control decisions and establishing minimum training and on-the-job experience. The Navy's current overseas management-by-committee framework does not follow EPA training and certification guidelines. Navy overseas water treatment plants are operated and supervised by uncertified personnel who often lack training and vital experience. The proposed SECNAV Primacy Agency Office would enforce minimum training standards and certification protocol in line with the EPA guidelines.

NAS Sigonella's two water treatment plants are manned by a combination of local national, DoD civilian and military personnel (Seabees). Personnel do not receive the training or certification

<sup>29</sup>Federal Register, Vol. 64, No. 24, Part III, Environmental Protection Agency, Final Guidelines for the Certification and Recertification of the Operators of Community and Nontransient Noncommunity Public Water Systems; Notice, 5 February 1999

<sup>30</sup>Federal Register, 5919, 5 February 1999

required of their peers at comparable Navy water treatment facilities in the United States. Likewise, operational supervisors, environmental or public health personnel providing local oversight of the drinking water program are not required to be trained or certified in waterworks operations. Ad-hoc and informal on-the-job training is frequently used to educate overseas water treatment staff. Even under the best circumstances, the frequency of personnel turnover limits site-specific knowledge and continuity of operations. Problems related to relying on transient military personnel to manage and operate NAS Sigonella water treatment systems have been identified in sanitary surveys since 2001. However, NAS Sigonella has not significantly improved operator training requirements for over 12 years.

While some Seabees assigned to NAS Sigonella have utility system training and experience, most lack the water treatment training, experience and certification required in the United States. Military water plant operator assignments are often a short-term collateral duty. The frequent turnover of Seabees is a significant limitation to obtaining on the job experience necessary to become proficient enough to optimize water treatment plant operations. Primacy agencies in the United States do not tolerate water treatment plant operation by unqualified personnel. The Navy must reconsider assigning short-term, military personnel that lack the knowledge, skill sets and experience to operate compliant water treatment systems.

The deficiencies documented in Navy operating records and third-party reports for over a decade stand in stark contrast to the Navy's commitment to manage overseas drinking water compliance and protect the health of our people. Four years after SECNAV's imperative, owners/operators of Navy overseas water systems still do not seem to acknowledge risks to our people or reputation. The persistence of deficiencies also represents a long-term legacy risk for the Navy. Unlike other high profile, high risk Navy issues, the volume of information in Navy files documenting Sigonella's unresolved water system deficiencies is indisputable. Historical records of public health-related issues at NAS Sigonella have the same potential for high profile negative consequences for the Navy that Camp Lejeune has for the Marine Corps. These legacy issues, along with additional Sigonella examples, are further discussed in the next chapter.

## **Chapter 4: Legacy Issues at NAS Sigonella**

### **4.0 Introduction**

Throughout this special study we have repeatedly emphasized that the priority of the Navy's overseas drinking water program must be protection of the health and welfare of our Navy personnel and dependents. NAVINGEN believes this priority, as well as the 2009 SECNAV imperative to deliver U.S. quality drinking water to all Navy personnel overseas, can be achieved if the Navy establishes a primacy agency with the authority and resources necessary to provide direct oversight and enforcement of drinking water system operations.

Implementing the recommendation to establish such a primacy agency (see Figure 1-5) and ensuring CNIC, NAVFAC and BUMED provide the management resources necessary to properly operate and maintain drinking water systems are reasonable, proven and efficient courses of action for meeting SECNAV's 2009 imperative. Chapters 1-3 presented multiple deficiencies related to oversight, management and operations of the Navy's overseas drinking water program. If left uncorrected, these deficiencies could develop into legacy issues for the Navy. In some cases, such as Sigonella, the Navy has documented more than a decade of uncorrected deficiencies, poor system performance and violations of U.S. standards and FGS.

This chapter is written from the perspective that protecting the health and welfare of Navy personnel is the priority. The Navy has a responsibility to correct long-standing deficiencies, meet SECNAV's 2009 imperative, and take appropriate action to employ risk-reduction strategies to protect Navy personnel who may have increased health risks due to exposure to drinking water of questionable quality while stationed overseas. This chapter provides a discussion of risk factors involved in past public health incidents and comparisons to Camp Lejeune for context to indicate the significance of the legacy issues that are associated with NAS Sigonella. In addition, this chapter provides examples of legacy issues at Mineo Family Housing and Naval Radio Transmitter Facility (NRTF) Niscemi.

### **4.1 Comparisons between NAS Sigonella and Camp Lejeune**

NAVINGEN has observed that the documented history of drinking water deficiencies at NAS Sigonella has the potential for similar legacy issues like those that are under scrutiny at Camp Lejeune. This comparison is not focused on the specific drinking water contaminants, their concentrations, their sources or the overall “science” that has been applied to potentially correlate adverse health outcomes to drinking water contaminants at Camp Lejeune. The

comparison is focused on other issues such as: periods of time where analytical test results are either absent or suspect, long-standing documented deficiencies with failure to take appropriate corrective action in a timely manner and a lack of effective public notification regarding the quality of the drinking water. Navy leadership should be aware that these issues are discussed in the preceding chapters of this special study regarding NAS Sigonella.

This comparison also focuses on common risk factors that often carry equal or more weight than the actual science and have become universal to similar Navy public health issues over the past several decades (Atsugi Incinerator, Vieques Bombing Range, Fallon Cancer Cluster, Naples Public Health Evaluation and Mold in Military Housing). Many of the factors listed below apply to Camp Lejeune and have the same potential to apply to NAS Sigonella:

- Stakeholder perception of risk is stakeholder reality including a perceived betrayal of organizational core values.
- Organizations inappropriately accepting health risks on behalf of the stakeholders without their knowledge or consent.
- Poor organizational response and lack of transparency leading to perceived or actual cover-up and negligence.
- Congressional interest and/or legislation leading to creation of personnel exposure registries (e.g., Poisoned Patriots - <https://clnr.hqi.usmc.mil/clwater/>).
- Galvanized activists and/or advocacy groups.
- Motivated media coverage.
- Potential legal compensation and health care benefits for affected Navy personnel and dependents.
- External third-party investigations (e.g., U.S. GAO, Agency for Toxic Substances and Disease Registry, National Research Council).

Risk studies<sup>31</sup> have documented the lack of a statistical correlation between the ranking of hazards by technical experts based on empirical data and the ranking of those same hazards by the general public based on emotional reactions. Science is a competing factor and does not always clearly drive decisions related to public health risks. Compensation (e.g., health benefits) for public health exposures continues to gain acceptance as the norm despite the absence of definitive science establishing causative relationships between exposure and adverse health outcomes.

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<sup>31</sup>McDaniels, T.L., Axelrod, L.J., Cavanagh, N.S., Slovic P., Perception of Ecological Risk to Water Environments, Risk Analysis, 17(3)341-52, June 1997

For example, President Obama signed the *Honoring America's Veterans and Caring for Camp Lejeune Families Act of 2012* to compensate approximately one million residents of the base between 1957 and 1987 for possible adverse health outcomes linked to the water contamination. Subsequent to signing the Act, the following statements were posted on several activist and veterans' organization websites:

*"One major hurdle was to get Congress to act before completion of ongoing scientific studies that are expected to show more precise levels of contamination and populations exposed."*<sup>32</sup>

Another notable statement came from a Camp Lejeune former resident and activist:

*"This is not the epilogue," Jerry Ensminger said. "This is the end of the first act, because we still have not gotten the whole truth, nor the accountability of the people who were responsible for perpetrating this. That's next."*<sup>33</sup>

Additionally, in March 2010, the Head of the U.S. House of Representatives Committee on Science and Technology's Oversight Panel Investigation of Camp Lejeune Water Contamination asked:

*"Did they know about it during the 30 years when Marines and families were exposed to the water? Did they know about it and not do anything to stop it?"*<sup>34</sup>

These statements along with the headlines presented in Figure 4-1 indicate public perceptions over the lack of transparency and inaction concerning the drinking water at Camp Lejeune.

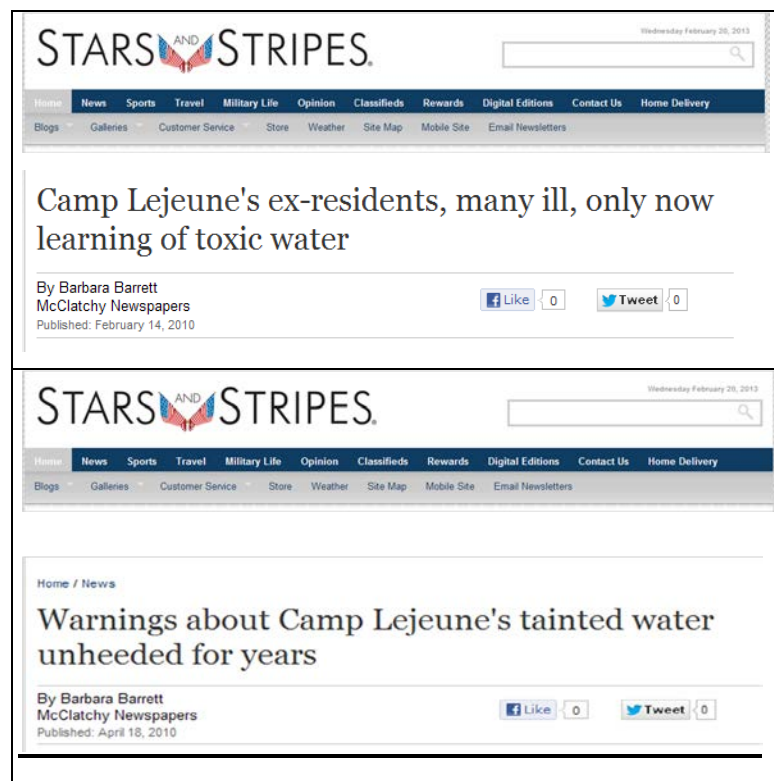


Figure 4-1. Camp Lejeune news headlines about contaminated water. Source: Stars and Stripes, 14 February and 18 April 2010

<sup>32</sup>Philpott, T., Help for Ailing Lejeune Vets, Families, [Military.com](http://www.military.com/features/0,15240,248599,00.html), <http://www.military.com/features/0,15240,248599,00.html>, 9 August 2012

<sup>33</sup>Philpott, T., 9 August 2012

<sup>34</sup>Barrett, B., Navy Antes Up For Lejeune Study, The News & Observer, <http://newsobserver.com/2010/03/03/366899/navy-antes-up-for-lejeune-study.html>, 3 March 2010

When treated with fairness, honesty and respect, people are able to make informed decisions (e.g., drink bottled water) and are less likely to overestimate risks. Conversely, when people feel they are not treated with fairness, honesty and respect concerning drinking water quality and potential adverse health outcomes, there is little that can prevent anger or outrage.

Despite the long history of drinking water deficiencies at NAS Sigonella, media coverage has only recently occurred. In May 2012, Stars and Stripes published an article concerning the bromate contamination at NAS Sigonella (Figure 4-2). NAS Sigonella issued public notification of the



Figure 4-2. Stars and Stripes article on bromate in NAS Sigonella's drinking water. Source: Stars and Stripes, 29 May 2012

bromate exceedance. NAVINGEN has observed that the public notification procedure violated U.S. standards and FGS; information contained in the public notification was not accurate (discussed in Chapter 2). Figure 4-3 contains responses from Navy personnel questioning the delayed notification, the true condition of the drinking water and concerns about links to cancer. These comments indicate Navy personnel perceive they were not treated with fairness, honesty

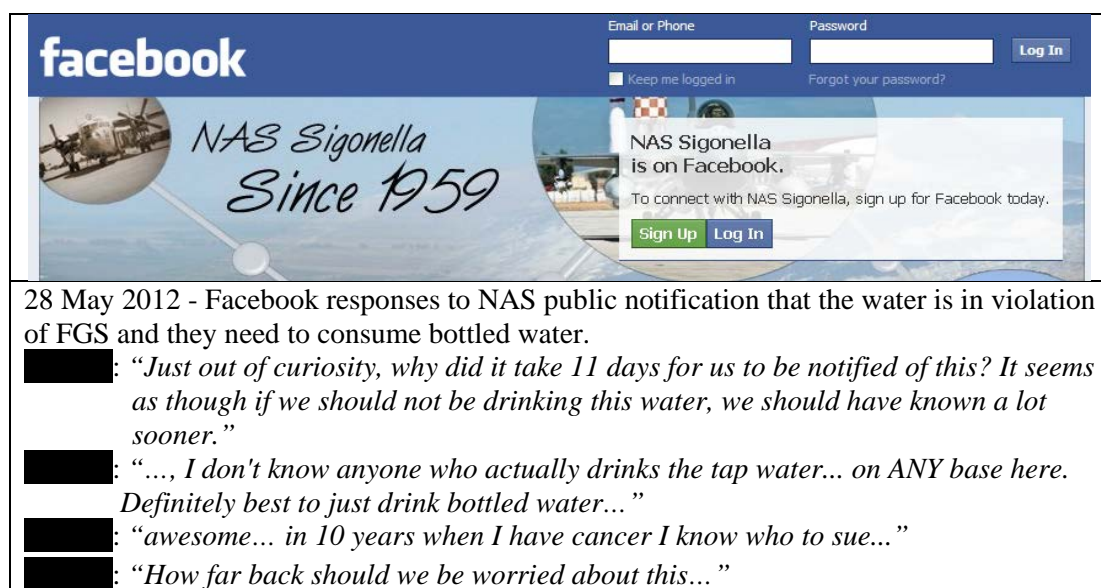


Figure 4-3. Navy personnel (names redacted) raise questions and concerns regarding health risks from bromate. Source: NAS Sigonella facebook, <http://www.facebook.com/nassigonella/posts/10151006328433336>, 28 May 2012



and respect. In the absence of timely notification and disclosure, people will calculate their own risk, draw individual conclusions and take individual action.

Prior to our Europe Area Visit in the fall of 2012, NAVINGEN conducted an on-line survey that asked Navy personnel specific questions about the potable water supplied by NAS Sigonella. One question concerned the extent to which personnel were notified of water quality issues; another regarding their satisfaction with water quality. Forty percent of respondents indicated they

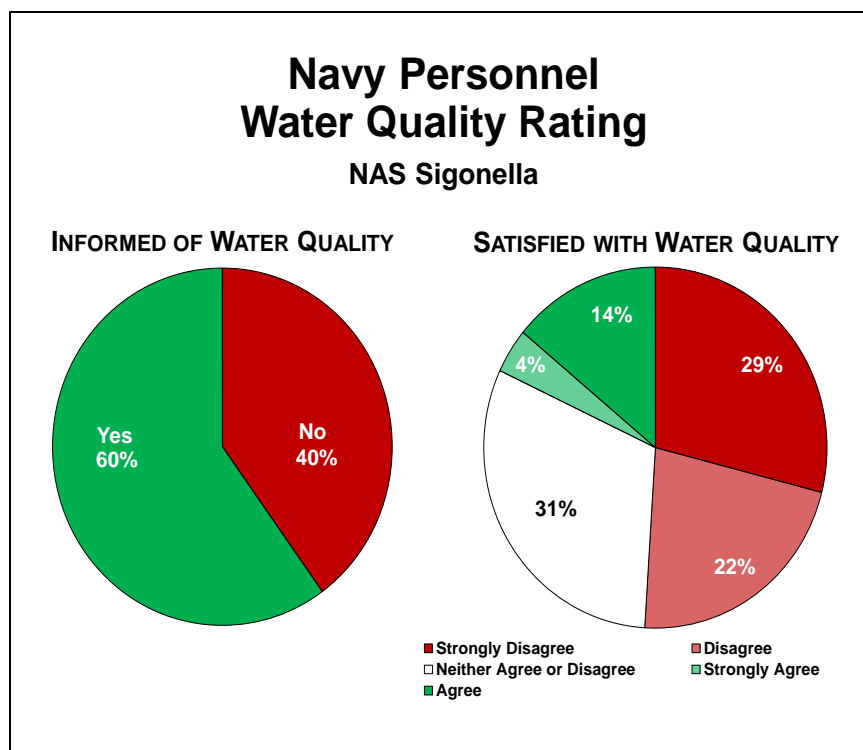


Figure 4-4. Percent of Navy personnel informed and satisfied with water quality.  
Source: NAVINGEN Europe Area Visit On-line Survey, March 2012

were not informed of water quality issues at NAS Sigonella (Figure 4-4). In addition, only 18 percent of respondents indicated they were satisfied with the water quality.

Note the risk factors and comparisons to Camp Lejeune in this discussion that are not focused on the actual science, contaminants, or water standards related to drinking water. While critics can point out that NAS Sigonella should not be compared to Camp Lejeune based upon differing contaminants and potential adverse health outcomes, that is not the point. The more important point is how leadership deals with common risk factors and potential adverse health outcomes. NAVINGEN considers NAS Sigonella (and other overseas installations) as a high risk for the Navy regarding potential adverse health outcomes for Navy personnel, future liability and damage to reputation.

Informally, negative perceptions of the drinking water quality at NAS Sigonella have been discussed among Navy personnel and their dependents for years. The negative perceptions are likely to deepen as legacy issues regarding drinking water at NAS Sigonella are revealed. Will we see similar activism and Congressional interest (compared to Camp Lejeune) when

information regarding documented legacy water deficiencies at NAS Sigonella become the focus of stakeholder interest under the Freedom of Information Act? Most likely, the answer is yes.

## 4.2 Specific Sigonella Legacy Locations

Legacy, in this context, is defined as a location where the Navy has documented past drinking water management and operational practices and failed to initiate corrective action to comply with Navy regulations, FGS or U.S standards, that could potentially result in adverse health outcomes to Navy personnel and their dependents. In addition to the issues discussed throughout this study, the deficiencies at Mineo and Niscemi are potentially significant liabilities to the Navy and for Navy personnel that used drinking water at these locations.

### Mineo Family Housing

Mineo Family Housing is approximately 20 miles from NAS Sigonella. It was constructed in 1999 and operated by an Italian company under a lease agreement for six years before the Navy conducted a sanitary survey to evaluate the drinking water operations that served the 1,580 residents. The 2005 sanitary survey found severe deficiencies that should have been identified and corrected before Navy personnel were allowed to occupy the housing units. The scope and magnitude of the deficiencies were so egregious, the consultant conducting the sanitary survey recommended the Navy declare the water non-potable. Specific statements from Mineo's 2005 sanitary survey<sup>35</sup> include:

*"Poor microbiological quality...occurrences of E. coli, total and fecal coliforms, streptococci as well as elevated levels of standard and heterotrophic plate counts..."*

*"Chloramine-T, which is added to the blended water...is of unknown effectiveness and not approved for use in potable water treatment."*

*"The FDA has also voiced concerns that the metabolite of Chloramine-T...might be a carcinogen."*

*"Because an unapproved chemical of unknown effectiveness is used for the disinfection and [the system is] not monitored...the primary disinfection requirements of the FGS are not being met at the Mineo water treatment plant."*

*"Most disconcerting about the analytical results is the fact that brominated species, which are thought to be more carcinogenic...comprise over 95% of the total THMs."*

*"...housekeeping practices were poor. No operational records were available."*

<sup>35</sup> AH Environmental Consultants, Sanitary Survey, 6-4, 6-6, 6-7, 6-15, 6-17, 6-18, August 2005

*“In light of the source water vulnerabilities, inadequate disinfection, lack of water quality monitoring, poor housekeeping practices, past occurrences of [bacteria] in the distribution systems...and the use of unapproved chemicals it would be prudent to declare the drinking water system at Mineo non-potable until the contractor has brought the operation into compliance...”*

If the Mineo housing complex was in the United States and regulated by a primacy agency, extensive testing and frequent monitoring of the water source would be required to ensure the consistent production of safe water every day. There is no evidence that Navy officials approved the water source or even routinely monitored the treatment system to ensure the water complied with applicable standards and was safe to drink. For at least six years, thousands of Sailors and their dependents residing at Mineo drank, washed and bathed in this water without knowledge of its deficiencies. As a result, thousands of people remain unaware of their potential exposure to harmful contaminants with the possibility of future adverse health outcomes. This is a striking parallel to Camp Lejeune. The response of families who lived in Mineo (and assumed the Navy was providing safe drinking water) will likely be anger and a feeling of betrayal when they discover that Navy reports documented drinking water was not fit to drink and they were not given the information necessary to protect the health of their families. This potential anger will be magnified if they experience adverse health outcomes.

### **Naval Radio Transmitter Facility (NRTF) Niscemi**

The history of failure to operate and manage compliant drinking water systems at NRTF Niscemi is another location with the potential for legacy issues similar to Camp Lejeune. NRTF Niscemi is a tenant command of NAS Sigonella located approximately 45 miles from the main base. For over 20 years, the Navy did not investigate the water source and confirm that the water was safe to drink. This is similar to the Mineo housing area, where the Navy cannot verify that personnel at Niscemi received drinking water that met FGS and Navy regulations. In 2008, NRTF Niscemi drinking water was tested and found to be non-potable due to bacterial and nitrate contamination that exceeded MCLs. Because there are no documented water tests prior to 2008, Navy personnel may conclude that water consumed over the previous 20 years was contaminated. The Navy has no record to dispute this potential conclusion and cannot demonstrate that public health was the priority for this drinking water system.

From 2008 to 2013, several water treatment systems were installed at NRTF Niscemi to improve drinking water quality. However, as discussed in Chapters 2 and 3, these systems were not managed, maintained or operated in compliance with FGS and Navy regulations. For example, a

chlorination system was installed in 2008, yet a contractor found that no one refilled the chlorine feed tanks for over a year, exposing Navy personnel to water that was not disinfected. This failure to operate and maintain water system compliance is documented in multiple reports. For example, the first sanitary survey for NRTF Niscemi was conducted in 2009 and, similar to Mineo, documented water was not suitable for human consumption and identified poor water treatment, testing and management practices including:<sup>36</sup>

*“Proper treatment is NOT generally provided. The major shortcoming of the existing water treatment is lack of disinfection...”*

*“There are no water plant treatment records.”*

*“No daily operational water quality analysis such as pH...and total chlorine...”*

*“...treated water contains nitrate concentrations above the maximum contaminant level. In addition, the water tested positive for total coliform, E. coli and Enterococci bacteria.”*

Additionally, during our NAVINSGEN Area Visit in September 2012, we found operations, maintenance and monitoring were still inadequate. Public works and preventive medicine personnel did not properly operate nor monitor the NRTF Niscemi water system in accordance with U.S. standards and FGS. Operational log sheets at NRTF Niscemi reviewed during the visit revealed drinking water was inadequately disinfected during 2012. Navy personnel were not notified of inadequate disinfection and the potential adverse health effects from consuming this water. The failure to properly manage and operate the NRTF Niscemi drinking water system resulted in continued deficiencies and violations of U.S. standards and FGS through 2013.

The failure to correct long-standing deficiencies documented in multiple official reports at NAS Sigonella, Mineo Family Housing and NRTF Niscemi increases the Navy’s risk of future liability, risk to reputation and most importantly risks to our people. The current management-by-committee framework that combines oversight and management functions lacks the capability to ensure compliance with U.S. standards, FGS and Navy regulations. Furthermore, because the current managerial framework is tasked with both oversight and management functions, there is a lack of managerial focus on detailed water system operations. In our opinion, the Navy’s poor management and lack of priority focus on public health has led to potential legacy issues at NAS Sigonella and most likely many other Navy installations overseas. Implementation of the SECNAV Primacy Agency Office will improve future drinking water quality by enforcing

<sup>36</sup>AH Environmental Consultants, Sanitary Survey, ES-7, 7-4, 7-6, October 2009

drinking water system compliance with U.S standards, FGS and Navy regulations. However, the long history of uncorrected deficiencies are now legacy issues that must be addressed. The Navy must develop a risk-reduction strategy that assesses potential adverse health outcomes in order to reduce liabilities, limit adverse public reaction and take care of our people.

### **Recommendations:**

- 4-1. SECNAV convene a multidisciplinary team to assess health risks and potential liabilities, and develop a risk-reduction strategy for the Navy's overseas drinking water programs. The multidisciplinary team should include representatives knowledgeable and experienced in areas such as water operations, legal, auditing, public relations and risk assessors with specialized public health expertise.
- 4-2. CNO direct CNIC, NAVFAC and BUMED to collect and retain all overseas drinking water program documents and records in support of the SECNAV multidisciplinary team. CNIC, NAVFAC and BUMED ensure documents throughout their organizations are not destroyed (as currently permitted under FGS.)
- 4-3. CNO ensure CNIC, NAVFAC and BUMED implement the risk-reduction strategy developed by the SECNAV team.

## Appendix A: Senator Warner Letter

MARK R. WARNER  
VIRGINIA

United States Senate  
WASHINGTON, DC 20510-4606

COMMITTEES:  
BANKING, HOUSING, AND  
URBAN AFFAIRS  
COMMERCE, SCIENCE, AND  
TRANSPORTATION  
BUDGET  
RULES AND ADMINISTRATION

April 4, 2013

The Honorable Charles Hagel  
Secretary of Defense  
The Department of Defense  
The Pentagon, Suite 319  
Washington DC 20301

Secretary Hagel,

I am writing to express my concerns about the safety conditions at Department of Defense (DoD) Child Development, Youth Centers, and medical facilities. Specifically, it has come to my attention that DoD may not be adequately protecting our children, youth and pregnant mothers from potential lead exposure in drinking water in excess of safe levels. As you are aware, the Environmental Protection Agency identifies children and pregnant women as two groups at the highest risk for lead exposure, which can cause serious medical issues including permanent damage to the brain and nervous system that can result in behavioral and learning problems.

By way of background, U.S. Navy officials in Hampton Roads, Virginia recently reported to my office that they began testing for lead in drinking water in Child Development Centers (CDC) in October 2012. This testing revealed that two of the nine CDCs had levels of lead in the drinking water that far exceeded EPA safe levels of 20 parts per billion (ppb). To their credit, the local command responded quickly by securing the affected systems, notifying the parents in a frank and timely way, and they have taken a generally proactive approach to alerting other facilities in the region.

It is my understanding that the instruction mandating this testing was dated 30 October 2007, yet testing was not initiated until October 2012 -- a delay of five years. This is not acceptable. The Navy's policy is very clear that lead testing of "high priority areas" where children, youth, and expectant mothers would be exposed is required to be done. OPNAVINST 5090.1c, 10-5.2(c) states: "All Navy installations shall sample, test and maintain resultant records for all drinking water coolers and outlets in the following priority areas to determine the presence of lead: primary and secondary schools, day care centers, hospital pediatric wards maternity wards and food preparation areas located on medical facilities."

Although I appreciate the Navy's prompt response to the particular situation at the Hampton Roads CDCs, this incident raises larger questions. I would request that your staff provide us with a briefing that answers the following questions by 1 May 2013:

<http://warner.senate.gov>  
PRINTED ON RECYCLED PAPER



- What is the DoD policy to ensure compliance with the EPA's Safe Drinking Water Act, especially in high priority areas including child care and youth centers?
- What is the expectation of compliance with this instruction, what is the timeline for testing, and how does DoD ensure compliance?
- Are there any branches of the military service that currently lack instructions mandating safe drinking water testing at high priority facilities as defined above and, if so, how will DoD ensure compliance with EPA guidelines?

In addition, I would request that your staff provide the following specific information:

- the number of DoD child care centers, schools and pediatric maternity wards that are covered by this instruction.
- how many facilities sample, test and maintain records as required.
- the number of facilities that have tested positive and what was done to mitigate the problem.
- the number of facilities that have not complied to date, and DoD's plan to bring noncomplying facilities into compliance.

I know that you share my belief that we absolutely owe it to our military families to ensure we are providing first-rate, safe facilities on our military installations, especially for the children of our troops, many of whom are deployed and rely upon us to provide their families safe and adequate housing and child care. I look forward to working with you on this issue. If you or your staffs have any question, please contact Mark Brunner in my office. He can be reached at 202-224-2023.

Sincerely,

  
MARK R. WARNER  
United States Senator

## Appendix B: Talking to Your Customers About Chronic Contaminants in Drinking Water



### TALKING TO YOUR CUSTOMERS ABOUT CHRONIC CONTAMINANTS IN DRINKING WATER

#### A BEST PRACTICES GUIDE



This fact sheet will help you understand the importance of communicating with the public about chronic contaminants – both regulated and unregulated. It also describes effective strategies for getting your message out.

#### What Are Chronic Contaminants?

Drinking water contaminants that can cause health effects after continuous long-term exposure at levels greater than the maximum contaminant level (MCL) are considered “chronic” contaminants. Examples of chronic drinking water contaminants regulated by EPA include inorganic contaminants like arsenic, cadmium, and copper; organic contaminants such as pesticides and industrial chemicals; and radiological contaminants like radium and uranium.

In contrast, “acute” contaminants can cause short-term health effects within hours or days of exposure. Microbes such as *E. coli* and *Cryptosporidium* are examples of contaminants that can cause an acute health risk. Some chronic-type contaminants can also fall in this category if they are present at high enough concentrations to cause immediate health effects. For example, nitrate levels over the MCL can cause “blue-baby” syndrome in children less than 6 months.

#### What Do My Customers Want To Know About Chronic Contaminants?

Your customers are likely to wonder:

- What types of chronic contaminants are in my drinking water?
- How do they get into my drinking water?
- Should I be concerned?
- What are the health effects?
- What is EPA's standard for these contaminants?
- What is my drinking water utility doing to reduce or remove these contaminants?

EPA's Web site has extensive information on each regulated contaminant and has several fact sheets on chronic contaminants that you can print out or order for your customers. For more information on the contaminants that are currently regulated by EPA, go to the EPA Web site at <http://www.epa.gov/safewater/contaminants/>.

#### Why Should I Talk To My Customers About Chronic Contaminants?

It is important that the public understands that there are no immediate health risks from consuming drinking water containing a regulated chronic contaminant at levels below the MCL. Customers should be aware that chronic contaminant levels exceeding the MCL could cause cancer, liver or kidney problems, reproductive difficulties, or other health effects. In addition, sensitive groups of people, such as the young, elderly, pregnant women, and cancer patients may be more susceptible to adverse health effects at any level of exposure.

Every communication with the public provides an opportunity to:

- Build the public's trust;
- Develop closer ties to your community;
- Explain your utility's commitment to delivering safe drinking water;
- Prepare the public for future communication about health risks; and
- Gain support for investment in their water system.

#### How Are Chronic Contaminants Regulated?

In 1974, Congress passed the Safe Drinking Water Act (SDWA) to give EPA the authority to set standards to ensure the safety of drinking water provided by public water systems. The SDWA, which was amended in 1986 and 1996, directs EPA to establish non-enforceable health goals called maximum contaminant level goals (MCLGs) which reflect the level at which no adverse health effects are expected from a particular contaminant. Once an MCLG is established, EPA sets enforceable standards for contaminants called maximum contaminant levels (MCLs). MCLs are set as close to the health goals as possible considering cost, benefits, and the ability of public water systems to detect and remove contaminants using appropriate treatment technologies. When there is no reliable method to measure a contaminant that is economically and technically feasible, EPA develops a treatment technique requirement rather than an MCL. EPA continues to assess the occurrence of unregulated contaminants through the Unregulated Contaminant Monitoring Regulation (UCMR). Information about the UCMR can be found at <http://www.epa.gov/safewater/ucmr/>.

## What Kind of Public Notification about Chronic Contaminants is Required?

EPA published a revised Public Notification Rule on May 4, 2000 to make it easier and more effective to communicate with consumers. Public notification is required for any of the following SDWA violations:

- Exceedances of maximum contaminant levels (MCLs) or maximum residual disinfectant levels (MRDLs);
- Violation of treatment techniques;
- Monitoring and testing procedure violations; and
- Failure to comply with the schedule of a variance or exemption.

Other situations (not violations) that require public notification include:

- Operation under a variance or exemption;
- Occurrence of a waterborne disease outbreak or other waterborne emergency;
- Exceedance of the secondary maximum contaminant level for fluoride;
- Availability of unregulated contaminant monitoring results;
- Exceedance of the nitrate MCL in non-community systems that have been granted permission by the primacy agency to continue to exceed the nitrate MCL of 10 mg/l (although they must not exceed 20 mg/l).

More information on public notification requirements can be found at <http://www.epa.gov/safewater/publicnotification/>.

## How Can I Talk To My Customers?

When proactively engaging the public about chronic contaminants, public water systems have many options. In addition to providing required annual Consumer Confidence Reports, other avenues for communication may include:

- Host public meetings;
- Invite the public on facility tours;
- Publish articles in local newspapers;
- Provide interviews on local television and radio programs;
- Host a Web-based discussion forum;
- Post notices in places groups congregate (grocery stores, community centers, health clinics, etc.);
- Use bill inserts; and
- Partner with local government officials, healthcare providers, religious institutions, elder care providers, and other community leaders to share information.



## What Are Some Best Practices For Effective Communication About Chronic Contaminants?

If you expect that your public water system will exceed EPA's standard for a contaminant or that the costs of compliance may require public funding, communicate early and often. The most effective communication efforts follow these simple steps:

- Provide simple, straightforward, *and consistent* messages;
- Describe potential adverse health effects and populations at risk;
- Describe actions you are taking to correct the situation and when you anticipate it will be resolved;
- Describe actions the consumer can take such as using alternate water supplies and when to seek medical help;
- Provide links to useful information resources such as EPA's Web site.
- Use graphics, photographs, maps, charts, and drawings to illustrate your messages;
- Assume that consumers will only read the top half of the notice or what can be read in ten seconds;
- Display important elements in bold and/or large type in the top half of the notice;
- Communicate in multiple languages to meet the needs of your non-English speaking consumers; and
- Include contact information for further information in *all* communications.

## Where Can I Learn More About Chronic Contaminants and Communication?

To learn more about chronic contaminants, visit EPA's Safe Drinking Water Web site at <http://www.epa.gov/safewater> or call the Safe Drinking Water Hotline at 1-800-426-4791.

A useful primer on health risk communication can be found at <http://www.atsdr.cdc.gov/risk/riskprimer/>.

## Appendix C: Your Disinfection Team: Chlorine & pH



Fact Sheet for pool staff/owners

### Your Disinfection Team: Chlorine & pH Protection Against Recreational Water Illnesses (RWIs)

Protecting swimmers and their families from RWIs is the reason that pool staff regularly check both chlorine and pH levels. Chlorine and pH, your disinfection team, are the first defense against germs that can make swimmers sick.

#### What does chlorine do?

Chlorine kills germs in pools--but it takes time to work. Therefore, it's important to make sure chlorine levels are always at the levels recommended by the health department (usually between 1.0 - 3.0 ppm).

#### Why does chlorine need to be tested regularly?

All sorts of things can reduce chlorine levels in pool water. Some examples are sunlight, dirt, debris, skin, and fecal matter from swimmer's bodies. That's why chlorine levels must be routinely measured. However, the time it takes for chlorine to work is also affected by the other member of the disinfection team, pH.

#### Why is pH important?

Two reasons. First, the germ-killing power of chlorine varies with pH level. As pH goes up, the ability of chlorine to kill germs goes down. Second, a swimmer's body has a pH between 7.2 and 7.8, so if the pool water isn't kept in this range then swimmers will start to feel irritation of their eyes and skin. Keeping the pH in this range will balance chlorine's germ-killing power while minimizing skin and eye irritation.

#### What else can be done to promote Healthy Swimming?

The best way to kill germs is by routinely measuring and adjusting both chlorine and pH levels. Since a few germs can survive for long periods in even the best-maintained pools, it is also important that swimmers become aware of Healthy Swimming behaviors (don't swim when ill with diarrhea, don't swallow pool water, take frequent bathroom breaks, and practice good hygiene). Combining Healthy Swimming behaviors with good chlorine and pH control will reduce the spread of RWIs.

Water Quality	pH
Poor Chlorine Disinfection Eye Irritation Skin Irritation	> 8.0
Most Ideal for Eye Comfort and Disinfection	7.8
	7.6
	7.2
Eye Irritation Skin Irritation Pipe Corrosion	< 7.0

For more information about pool disinfection, go to [http://www.cdc.gov/healthyswimming/fecal\\_response.htm](http://www.cdc.gov/healthyswimming/fecal_response.htm)

*Healthy Swimming*



## Appendix D: Summary of Recommendations

- 1-1. SECNAV provide the manpower and resources required to establish the SECNAV Primacy Agency Office within the Assistant Secretary of the Navy, Energy, Installations and Environment (ASN EI&E) that could physically reside at NMCPHC. The SECNAV Primacy Agency Office would have immediate access to all the multidisciplinary public health resources at NMCPHC.
- 1-2. SECNAV direct the Primacy Agency Office to implement an oversight and enforcement system that models U.S. EPA primacy agency components and ensures Navy overseas installation drinking water programs meet SECNAV's 2009 imperative, and comply with DoD, FGS and Navy instructions (Figure 1-5).
- 1-3. CNO direct CNIC, NAVFAC and BUMED to ensure that management and operations of the overseas drinking water program occur with protecting public health as the priority and meet all applicable instructions.
- 1-4. CNO direct BUMED to develop a plan that aligns their public health mission with the current needs of the Navy to meet the public health compliance shortfalls within the overseas drinking water program; this will include ensuring that management and operations of the program occur with protecting public health as the priority of the program.
- 1-5. CNO direct BUMED to ensure a consistent level of experience, knowledge and training resides within their overseas installation preventive medicine personnel. Plans for implementation and routine progress shall be forwarded to the SECNAV Primacy Agency Office for their approval.
- 1-6. CNO direct BUMED to ensure the "medical surveillance for the drinking water program" has program elements (e.g., training, sampling methods and analytical methods) that are consistent with accredited clinical sampling and laboratory programs within BUMED. Direct BUMED to conduct internal oversight on this program and these reports shall be forwarded to the SECNAV Primacy Agency Office for their approval.
- 2-1. CNO direct BUMED, CNIC and NAVFAC to develop and implement a management framework with resources focused on managing water operations to ensure installation commanding officers comply with SECNAV's 2009 imperative, FGS and Navy regulations. The initial plan will be forwarded to the SECNAV Primacy Agency Office for approval and the management of overseas drinking water will receive continuous oversight and enforcement authority from the Primacy Agency Office.
- 2-2. CNO direct CNIC to take immediate action (e.g., public notification, additional monitoring, implementation of correction actions) for significant deficiencies identified during the One-Day Assessment process.
- 2-3. CNO direct CNIC, NAVFAC and BUMED to cease reinterpreting and redefining existing standards and definitions related to drinking water. Comply with existing instructions and standards that define potable water and acceptable uses for non-potable water; the primacy agency office will ultimately define definitions and standards criteria.

- 2-4. CNO direct BUMED to discontinue “health risk assessments” conducted by local preventive medicine personnel that circumvent U.S. standards, FGS and Navy regulations. Any health risk assessments (in rare and defined instances) should only occur with the full visibility of BUMED leadership and be conducted by a multidisciplinary team from NMCPHC.
- 2-5. CNIC direct NAS Sigonella cease blending untreated groundwater until clear evidence documents the groundwater is not under the direct influence of surface water.
- 2-6. CNO direct CNIC and NAVFAC to follow laboratory quality assurance processes outlined in Chapter 29 of OPNAVINST 5090.1C for Navy overseas drinking water systems.
- 2-7. CNO direct CNIC and NAVFAC to follow all regulations and standards regarding public notification; develop and implement a standard process for public notifications using the EPA Public Notification Rule and Public Notification Handbook.
- 2-8. CNO direct ICOs to immediately notify the appropriate chain of command for all MCL exceedances and instances of noncompliance. Once established, the Primacy Agency Office will also be notified.
- 3-1. CNO direct CNIC and NAVFAC to establish a water operations program using water log data to drive real-time actions to maintain water within compliant operating ranges. Forward program details to the SECNAV Primacy Agency Office for evaluation and approval.
- 3-2. CNO direct CNIC to establish a repository and require all managers of overseas potable water systems to submit operational logs to the SECNAV Primacy Agency Office for continual evaluation to ensure compliance.
- 4-1. SECNAV convene a multidisciplinary team to assess health risks and potential liabilities, and develop a risk-reduction strategy for the Navy’s overseas drinking water programs. The multidisciplinary team should include representatives knowledgeable and experienced in areas such as water operations, legal, auditing, public relations and risk assessors with specialized public health expertise.
- 4-2. CNO direct CNIC, NAVFAC and BUMED to collect and retain all overseas drinking water program documents and records in support of the SECNAV multidisciplinary team. CNIC, NAVFAC and BUMED ensure documents throughout their organizations are not destroyed (as currently permitted under FGS.)
- 4-3. CNO ensure CNIC, NAVFAC and BUMED implement the risk-reduction strategy developed by the SECNAV team.

## Appendix E: Acronyms

AOR	Area of Responsibility
ASN(EI&E)	Assistant Secretary of the Navy (Energy, Installations and Environment)
BUMED	Bureau of Medicine and Surgery
CASRN	Chemical Abstract Service Registry Number
CY	Calendar Year
CCR	Consumer Confidence Report
CFA	Commander, Fleet Activities
CFAS	Commander, Fleet Activities Sasebo
CFR	Code of Federal Regulations
CNFK, Det. Pohang	Commander, U.S. Naval Forces Korea, Detachment Pohang
CNIC	Commander, Navy Installations Command
CNICINST	Commander, Navy Installations Command Instruction
CNO	Chief of Naval Operations
CNR	Commander, Navy Region
CO	Commanding Officer
CONUS	Continental United States
CTO	Certificate to Operate
DBPR	Disinfectant Byproducts Rule
D.C.	District of Columbia
D-NC	Democrat-North Carolina
D-VA	Democrat-Virginia
DoD	Department of Defense
DW	Drinking Water
e.g.	For Example
ENV/EV	Environmental
EPA	Environmental Protection Agency
EURAFSWA	Europe, Africa, Southwest Asia
EXWC	Engineering and Expeditionary Warfare Center
FDA	Food and Drug Administration
FGS	Final Governing Standards
FOIA	Freedom of Information Act
GW	Groundwater
GWUDISW/GWUDI	Groundwater Under the Direct Influence of Surface Water
HQ	Headquarters
ICO	Installation Commanding Officer
IG	Inspector General
IWQB	Installation Water Quality Board
JBAB	Joint Base Anacostia-Bolling
JEGS	Japan Environmental Governing Standards
LANT	Atlantic
MAP	Maintenance Action Plan
MCL	Maximum Contaminant Level
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter
MILCON	Military Construction



NAS	Naval Air Station
NAS I	Naval Air Station I (Support Site Sigonella)
NAS II	Naval Air Station II (Operations Site Sigonella)
NAVFAC	Commander, Naval Facilities Engineering Command
NAVHOSP	Naval Hospital
NAVINSGEN/NAVIG	Naval Inspector General
NAVMED	Naval Medical Command
NMCPHC	Navy and Marine Corps Public Health Center
NPDWR	National Primary Drinking Water Regulations
NRTF	Naval Radio Transmitter Facility
NSA	Naval Support Activity
NSF	Naval Support Facility
N/A	Not Applicable
OEBGD	Overseas Environmental Baseline Guidance Document
OPNAV	Office of the Chief of Naval Operations
OPNAVINST	Office of the Chief of Naval Operations Instruction
O&M	Operations and Maintenance
PAC	Pacific
PDASN (EI&E)	Principal Deputy, Assistant Secretary of the Navy for Energy, Installations and Environment
PHC	Public Health Center
PMA/PMU	Preventive Medicine Authority/Preventive Medicine Unit
POA&M	Plan of Action and Milestones
POE	Point of Entry
POU	Point of Use
PT	Proficiency Testing
PW/PWD	Public Works/Public Works Department
Q	Quarter
REGCOM	Region Commander
RWQB	Regional Water Quality Board
SCADA	Supervisory Control and Data Acquisition
SECNAV	Secretary of the Navy
SDI	Silt Density Index
SDWA	Safe Drinking Water Act
SOP	Standard Operating Procedure
SS	Sanitary Survey
THM	Trihalomethane
USC	United States Code
U.S.	United States
USN	United States Navy
VA	Department of Veterans Affairs
VADM	Vice Admiral
WQOC	Water Quality Oversight Council
WQOG	Water Quality Oversight Group
WRT	With Regards To
WSSC	Washington Suburban Sanitary Commission

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